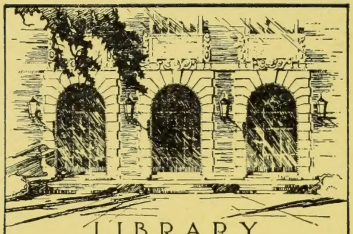

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CONTENTS.

PART I. (Issued July, 1891). PAGE.

KEMPE, REV. H. : A Grammar and Vocabulary of the Language of the Aborigines of the MacDonnell Ranges 1

LUDWIG, PROF. F. : Contributions on the Fungal Flora of Australia ... 55

ADAMSON, D. B. : Remarks on Photographing the Solar Eclipse of December 12, 1890 61

TEPPER, J. G. O. : Description of *Cossus Edwardsi* (plate i.) 63

BLACKBURN, REV T. : Descriptions of New Genera and Species of Australian Coleoptera (ix.) 65

STIRLING, DR. E. C. : Description of a New Genus and Species of Marsupialia (plates ii.-ix.) 154

MEYRICK, E. : Descriptions of New Australian Lepidoptera 188

PART II. (Issued December, 1891).

MEYRICK, E. *(continued)* 193

DIXON, S. : On a Subterranean Water-Supply for the Broken Hill Mines (plate x.) 200

SCHULZE, REV. LOUIS : The Aborigines of the Upper and Middle Finke River ; their Habits and Customs, with Introductory Notes on the Physical and Natural History Features of the Country 210

CHEWINGS, C. : Geological Notes on the Upper Finke River-basin (plate x) 247

TATE, PROF. R. : Note on the Silurian Fossils of the Upper Finke-basin 255

RENNIE, PROF., and E. F. TURNER : Note on a Volcanic Ash from Tanna 256

TATE, PROF. R. : Descriptions of New Species of Australian Mollusca, Recent and Fossil (plate xi.) 257

TATE, PROF. R. : A Second Supplement to a List of the Lamellibranch and Palliobranch Mollusca of South Australia 265

TATE, PROF. R. : A Bibliography and Revised List of the Described Echinoids of the Australian Eocene, with Descriptions of some New Species 270

STIRLING, DR. : Further Notes on the Habits and Anatomy of Notoryctes typhlops (plate xii.) 283

BLACKBURN, REV. T. : Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species (x.) 292

MAR 12 '52

PAGE

SCHLUMBERGER, M. C. : Description of a New Species of Fabularia (plate xiii., figs. 5-8) 346

HOWCHIN, W. : The Foraminifera of the Older Tertiary ; No. 2, Kent Town Bore, Adelaide (plate xiii., figs. 11-13) 350

HOWCHIN, W. : The Foraminifera of the Older Tertiary ; Muddy Creek—Addenda and Corrigenda (Plate xiii., figs. 9-10) 355

Abstract of Proceedings 357

Annual Report 364

Balance-sheet 367

Presidential Address 368

Donations to the Library 378

List of Fellows, Members, &c. 385

APPENDICES.

Report of the Field Naturalists' Section 389

Report of the Microscopical Section 393

Index 396

A Grammar and Vocabulary of the Language spoken by the Aborigines of the MacDonnell Ranges, South Australia.

By the Rev. H. Kempe, of the Mission Station, River Finke, Corr. Memb.

[Read December 2, 1890.]

PREFACE.

The result of an attempt to analyse a language of which the people speaking it have only a colloquial knowledge, and who are consequently incapable of answering or even understanding grammatical questions, must be in many respects imperfect. The difficulty is increased by the wandering habits of the people, making it impossible to maintain that constant communication with them which is necessary for the attainment of a complete knowledge of the structure of their language. It is only with the help of the boys grown up on the station, and who have become less nomadic than their elders, that the knowledge now gained has been established. There still remain mysterious phrases, incapable as yet of being traced back to their origin, awaiting solution. The following pages, therefore, do not profess to contain a complete vocabulary, nor one which would satisfy the learned philologist. Even up to the present day expressions crop up for things it was thought the natives had no words. The difficulty is increased by the close proximity of another tribe, for south of the Finke the natives speak a different language altogether, as their words terminate in *i* and *u* and *au*, whilst the others terminate all in *a*. As they have frequent intercourse with each other, it is very easy to understand that the natives to the north must have adopted many of the words and phrases of those to the south.

Concerning the vocabulary, it may be mentioned that it has been carefully compiled and revised several times with different natives, so that the words may be relied upon as correct.

These pages are submitted in the hope that they will prove interesting to the philologist, as exhibiting the peculiar structure of the language spoken by a people generally considered among the lowest in the scale of mankind, and will contribute a little towards perpetuating the knowledge of a language of one of the Australian tribes of natives before their probable entire extinction at a no very remote period.

The vocabulary is that of the tribe inhabiting the River Finke,

and is also, with only slight variations in the dialect, that of the tribes in the MacDonnell Ranges eastward to Alice Springs, but not far westward of the River Finke, and extending southward to the Peake.

GRAMMAR.

CHAPTER I.

Of the Characters taken to Represent the Sounds of the Language, and their Pronunciation.

VOWELS.

A a, like a in father, are
E e, like e in there, were
I i, like i in tin
O o, like o in more
U u, like u in dull, or o in more.

DIPHTHONGS.

Ai ai, like i in light
Au au, like ow in now
Oi oi, like oi in oil.

CONSONANTS.

B b, like b in be
D d, like d in do
G g, like g in go
H h, like h in here
J j, like y in year
K k, like k in king
L l, like l in long
M m, like m in more
N n, like n in near
Ng ng, like ng in ring
P p, like p in pipe
R r, like r in roam
T t, like t in to
Tj tj, like g in gentle
W w, like w in wife

These are the primitive sounds, to which for the sake of the pronunciation of the Scriptural names, were added—

F f, like f in far
S s, like s in so
Z z, like z in zero.

The vowels and diphthongs are to be considered as always short. In order to make the number of written characters as few as possible, the elongation of the syllable is indicated by a small stroke over the letter, as, lāda, "the paint," in which the a is to be pronounced long, as in far.

When two or three vowels occur, they form a dipthong; if not, they are separated by the mark of diœresis (··), as, leoïka.

CHAPTER II.

Of Substantives and their Cases, and of Prepositions.

Substantives have three numbers: singular, dual, and plural, but no distinctive mark for gender either by the use of an article or otherwise. There is no article

All words terminate in *a*, with the exception of the vocative of substantives, and the imperative mood of verbs which terminate in *ai*.

The dual is formed by adding the termination *ntatera* to the word, as, *atua*, "the man," *atuantatera*, "the two men."

Besides this there is a particular form of dual, which is only used personally by annexing the particle *nanga*, as, *wora*, "the boy; *woranauga*, "the two boys;" *kwara*, "the girl;" *kwaranauga*, "the two girls."

The plural is formed by adding *irbera* or *antirbera*, as, *aragutja*, "the woman," *aragutjirbera* or *aragutjantirbera*, "the women."

This form cannot be used in the neuter gender, but the form *ntatera* can also be used personally.

There are six cases—nominative, genitive, dative, accusative, ablative, and vocative.

a. The nominative is expressed in a double manner. The word is unchanged, if connected with an intransitive verb, as, *atua indama*, "the man sleeps," or *katjia lima*, "the child goes;" but it is formed by adding the particle "*la*," when it is unconnected with a transitive verb, as, *worala gama*, "the boy cuts," &c., or *apmala utnuma*," &c., "the snake bites," &c.

b. The genitive is formed by adding *ka*, as *kataka*, "of the father." By the genitive is expressed either possession, as, *wora kataka*, "the son *of the* father;" or it shows to whose advantage or disadvantage anything is done, as, *ta irbunga inaka kniribata ka*, "I fishes caught old man for," *i.e.*, "I caught fishes *for* the old man." It also expresses the purpose of any action, as, *aragutja inkuka laka*, "the woman went *for* bullrushes," *i.e.*, to fetch bullrushes.

c. The dative terminates in *na*, as, *ata katjiana ntema*, "I give *to the child.*"

d. The accusative is always unaltered, as, *ta kwatja njuma*, "I drink *water.*"

e. The ablative terminates in "*nga*," and shows the direction whence a thing comes, as *ta kwatja nanjinga inama*, "I fetch water *from the well;*" or it signifies the material from which a thing is made, as *era ulbainja ititjinga erbuma*, "he a boomerang of mulga makes;" or it signifies the cause for which a thing is done, as *jinga woringa tarama*, "I laugh *for the sake of the boy.*"

f. The vocative terminates in *ai*, as, *katjiai*, "child!"

The declension of the substantive may be seen by the following table:—

Singular.

Nom.	atua, or atula, the man.
Gen.	atuka, of the man.
Dat.	atuana, to the man.
Accus.	atua, the man.
Abl.	atuanga, from, for the man.
Voc.	atuai! man!

Dual (Personal).

Nom.	atuananga, the two men.
Gen.	atuanangaka, of the two men.
Dat.	atuanangana, to the two men.
Accus.	atuananga, the two men.
Abl.	atuananganga, from the two men.
Voc.	atuanangai ! you two men !

Dual (Neuter).

Nom.	lunjantatera, the two huts.
Gen.	lunjantateraka, of the two huts.
Dat.	lunjantaterana, to the two huts.
Accus.	lunjantatera, the two huts.
Abl.	lunjantateranga, from the two huts.

Plural.

Nom.	atuirbera or antuantirbera, the men.
Gen.	atuirberaka or antuantirberaka, of the men.
Dat.	atuirberana or antuantirberana, to the men.
Accus.	atuirbera or antuantirbera, the men.
Abl.	atuirberanga or antuantirberanga, from the men.

Other substantives are formed—

(a.) by adding to primitive substantives the particle "*ringa*," signifying something pertaining or belonging to a certain thing or place, as, *arila*, "sand ;" *arilaringa*, "a man belonging to or being at home in a sandy country ;" or *aputa*, "hills or ranges ;" *aputaringa*, "men whose home is in the ranges." This particle is also affixed to names of places, and expresses the place at which one is at home, as *mbarata*, "a place ;" *mbarataringa*, "men who are at home at *mbarata*."

(b.) Out of the roots of verbs, as, *gama*, "to cut ;" *ganangana*, "a cutting thing, *i.e.*, a knife ;" *indama*, "to sleep ;" *indanindana*, "a sleeping thing, *i.e.*, a bed ;" *tuma*, "to beat ;" *tunatuna*, "a man beating, *i.e.*, a beater ;" *ntema*, "to give ;" *ntenantena*, "a giving man, *i.e.*, a giver."

OF PREPOSITIONS.

There are two classes of prepositions, one class consisting of separate words and the other consisting only of small particles, annexed to the substantives, to which they belong as suffixed. As the prepositions, consisting of separate words, are placed at the end of the word to which they belong, they should be rather called *postpositions*. The majority always govern a certain case.

a. Those taking the ablative case are nine in number, viz. :—

1. *ulara*, "in front," as,

era atunga ulara tnama.

"he of man in front stands."

Ulara also governs the genitive case when used in the sense of "against" either friendly or hostile, as,

era tjinakatjina nukanaka ulara nama,
"he friendly me against is,"
i.e., "He is friendly towards me."

II. *topala*, "behind," as,
era woranga topala nama,
"he boy behind is,
i.e., "He is behind the boy."

III. *gatala*, "outside," as,
katjia iltanga gatala nama,
"child from house outside is,"
i.e., "He is outside the house."

IV. *mbobula*, "between," as,
kwara worateranga mbobula tnama,
"girl boys two between stands,"
i.e., "the girl stands between two boys."

V. *ntuara*, "other side" (Latin, *trans)*, as,
erila ulbaïinga ntuara lima,
"man river otherside goes,"
i.e., "the man goes on the other side of the river."

VI. *nunkara*, "this side" (Latin, *citra*), as,
ilta nuka ulbaïinga nunkara tnama,
"house my river this side stands."
i.e., "my house stands on this side of the river."

VII. *nkelala*, "beside" (Latin, *juxta*), as,
era nkelala katunga nama,
"he besides father sits."
i.e., "he sits besides the father."

VIII. *itinjawara*, "close by," as,
iltanga itinjawara,
"from house close by."
i.e., "close by the house."

IX. *ntuarintjirka*, "through," as,
nana ta altjuranga ntuarintjirka iwuma,
"this I hole through throw."
i.e., "I throw this through the hole."

b. Those with accusative case are four in number, viz. :—

I. *katningala*, "upon," as,
jinga aputala katningala tnama,
"I hill upon stand."

II. *katningalagana*, "over," as,
ngapa bira katningalagana ilbanama,
"crow tree over flies."
i.e., "the crow flies over the tree."

III. *kwanakala*, "down," as,

jinga aputa kwanakala luluma,
"I hill down climb."
i.e., "I climb down the hill."

IV. *kwanala*, "inside," as,

katjia iltakwanala nama,
"child house inside is."

c. Prepositions annexed to nouns as suffixes are nine, viz. :—

I. *una*, "on, upon, into," as, *kwatjuna*, "to the water;" *biruna*, "upon the tree;" *nanjuna*, "into the well."

II. *lela*, signifies the instrument with which or the person by whom anything is made or accompanied, as, *ilupalela*, "with the axe;" *erilalela*, "by the man;" *jinga erinalela lama*, "I go with him."

III. *la*, signifies the place where anyone is, as, *aputala*, "on the hill;" it is therefore annexed to all names of places, as, *tjoritjala*, "at Alice Springs;" *tungala*, "at Henbury."

IV. *gata*, "with" (Latin, *cum*), as,

atua tjatagata bitjima,
"the man spear with comes."

V. *raba*, "without," as,

era gararaba albuma,
"he meat without goes back."
i.e., "he goes back without meat"

VI. *gitjala*, "for, in exchange," as,

ta mana ntitjinanga irbungagitjala,
"I bread will give fishes for."
i.e., "I shall give bread for fishes."

VII. *kaguia*, "for the sake of," as,

unkwangakaguia ta tarama,
"your sake for I laugh."
i.e., "I laugh for the sake of you."

VIII. *kieka*, "on, to," as,

ta ipepa iltakieka kantatuma,
"I paper house on nail."
i.e., "I nail the paper on the house."
or, *erinakieka ta kumilaka*,
"him on I have sinned."
i.e., "on him I have sinned."
or, *nilknambakieka ta ngana numerilama*
"thief to I you count."
i.e., "I count you a thief."

IX. *ibera*, *ibena*, "from, out of," as,

iltibera, "out of the house;"
kwatjibena, "from the water."

CHAPTER III.

Of Adjectives and their Degrees of Comparison; of Numbers.

ADJECTIVES.

Adjectives may receive the same particle as the noun, to which they belong; the particle is generally omitted in one of the words, the substantive as a rule, for only the last word is declined, as,

ta katjia tera marana mana ntema,
"I child two good to bread give."
i.e., "I give bread to the two good children."

Besides these primitive adjectives, others are formed—

a. From substantives, by annexing the particle *karinga*, as, *kwatja*, "water;" *kwatjakaringa*, "watery;" or, *arila*, "sand;" *arilakaringa*, "sandy;" or the particle *buta*, as, *puta*, "stone;" *putabuta*, "stony;" or the particle *mata*, as, *kankinja*, "love;" *kankinjamata*, "loving;" *njirkna*, "hate;" *njirknamata*, "spiteful;" *kata*, "father;" *katamata*, "fatherly."

b. From the roots of verbs by adding the particle *ntjalkua*, as, *tnima*, "weep;" *tnintjalkua*, "disposed to cry;" *ankama*, "speak;" *ankantjalkua*, "talkative."

Of the degrees of comparison—

a. Comparative of equality:

nana tera mala knira naramanga,
"these two equal large are."

b. Comparative of superiority is formed by adding the particle *alkura*, as,

nana wora maralkura nama, nana ngetjina,
"this boy good more is, that than."
i.e., "this boy is better than that."

c. The superlative can only be expressed either by repetition of the word, as, *kunakuna*, "very bad;" or by adding the word, *indora*, "very," to an adjective, as, *tjenja*, "high;" *tjenjindora*, "very high."

d. Diminutives are formed by adding the particle *kotjirka* to the word, as, *putakotjirka*, "a very small stone;" *kurkakotjirka*, "a very small one."

NUMBERS.

There are primitively only numbers up to four, viz.:—*ninta*, "one;" *tera*, "two;" *teramininta*, "two by one," *i.e.*, "three;" *teramatera*, "two by two," *i.e.*, "four."

These numbers are declined in the same way as nouns when standing in place of one.

All higher numbers are expressed by:—*urbutja*, "some;"

arinabula, or *arungalura*, "a few;" *njara*, "many;" *njaraknura*, "very much."

CHAPTER IV.

Of Pronouns.

POSSESSIVE PRONOUNS.

The possessive pronouns are the only class of pronouns whose declension is perfect (all others are more or less defective as regards declension). They must therefore be taken first as in many instances they supply the deficiencies of other pronouns. All pronouns, if declinable, are with only slight alterations declined as substantives, as the following table, giving the declensions of the possessive pronouns, shows :—

Singular.

First Person.

Nom.	katjia nuka, my child.
Gen.	katjia nukanaka, of my child.
Dat.	katjia nukana, to my child.
Accus.	katjia nuka, my child.
Abl.	katjia nukananga, from my child.

Second Person.

Nom.	kwara unkwanga, thy girl.
Gen.	kwara unkwanganaka, of thy girl.
Dat.	kwara unkwangana, to thy girl.
Accus.	kwara unkwanga, thy girl.
Abl.	kwara unkwanganga, from thy girl.

Third Person.

Nom.	kata ekura, his, her, its father.
Gen.	kata ekuranaka, of his father.
Dat.	kata ekurana, to his father.
Accus.	kata ekura, his father.
Abl.	kata ekurananga, from his father.

Dual.

First Person

Nom.	maia ilinaka, the mother of us two.
Gen.	maia ilinakanaka, of the mother of us two.
Dat.	maia ilinakana, to the mother of us two.
Accus.	maia ilinaka, the mother of us two.
Abl.	maia ilinakananga, from the mother of us two.

Second Person.

Nom.	kalja mbalaka, the elder brother of you two.
Gen.	kalja mbalakanaka, of the elder brother of you two.
Dat.	kalja mbalakana, to the elder brother of you two.
Accus.	kalja mbalaka, the elder brother of you two.
Abl.	kalja mbalakanaka, from the elder brother of you two.

The third person dual, *ekuratera*, "their two," and all persons of plural, as, *anunaka*, "ours;" *araganka*, "yours;" and *etnika*, "theirs;" are treated exactly like those above.

Besides these there are other possessive pronouns, which have both a reflective and a reciprocal sense, acting however as possessive pronouns as well; in this case their meaning is, pertaining or belonging to any person.

They are only used in the nominative case, and are undeclinable.

nukara,	mine.
unkwangara,	thine.
ekurara,	his, hers, it.
ilinakara,	our two.
mbalakara,	your two.
ekuraratera,	their two.
anunakara,	ours.
aragankara,	yours.
etnikara,	theirs.

The following double forms have the same meanings:—*nukiltja* and *nukaringa*, "mine;" *unkwangiltja* and *unkwangaringa*, "thine," &c., but these two are like the first-named, regularly declined.

Nearly all pronouns may be connected with all specified prepositions in Chapter II—*katjia nukanauna*, "to my child;" *katjia nukalela*, "with or by my child," &c.

PERSONAL PRONOUNS.

a. First Person Singular.—There are two pronouns for "I," *i.e.*, *ata* or, the first *a* being dropped, *ta*. This is always used when connected with a transitive verb, as, *ta tuma*, "I beat," *ta ilkuma*, "I eat;" whereas connected with an intransitive verb, there is used *jinga*, as *jinga lima*, "I go," or *jinga indama*, "I sleep;" *ta* is indeclinable, but when, for instance, they say, "God gives me life," where give is a transitive verb, they use *jinga*, and say,

Altjirala jingana etata ntema.
"God to me life gives."

But supposing they say, "he died for me instead of me," this is expressed by the possessive pronoun *nuka*, as, *era nukanga iluka*, "he for me died," because *jinga* is only used in the nominative and dative cases.

b. Second person, *unta*, "thou, you." This stands also only in nominative case; where necessary they take for declension the possessive pronoun *unkwanga*, "thy." This is sometimes in genitive and dative cases abbreviated, viz.,

unkanganaka to ngaka,
unkwangana to ngana,
unkwanganga to nganga, as,
ta nana ngana ntema,
"I this you to give,"
i.e., "I give this to you."

c. The third persons singular, dual, and plural are regularly declined, like possessive pronouns. List of personal pronouns:—

ta or jinga,	I	eratera,	they two.
unta,	thou	anuna,	we.
era,	he, she, it	arankara,	you.
ilina,	we two	etna,	they.
mbala,	you two		

In connection with these is also used the suffix, *arpa*, "self," by annexing it to the personal pronouns, *ta*, *unta*, *era*, &c.,

ta arpa, contracted tarpa, I, myself,
unta arpa, contracted untarpa, thou, thyself,
era arpa, contracted erarpa, he, himself,

and the others the same. This form is also used in the sense of "not ordered," "not compelled," as,

ta erina ntankatjimakana, erarpa bitjima,
"I him called have not, he self comes,"

i.e., "I have not called him; he comes himself." Another form of emphatic sense is *utara* in singular, as,

unta kala rula tukala, tautara tuiai,
"you enough wood have cut, I shall cut,"

i.e., "you have cut wood enough; I shall cut." This is altered in dual and plural to *watera*, as, *ilinawatera*, *mbalawatera*.

Besides those above-mentioned, there are the following Reflective and Reciprocal Pronouns, viz.:—*nukara*, mine, *unkwangara*, "thy," &c.

Ex. reflective. *ta nukara tulama*,
"I myself beat."

Ex. reciprocal. *etnikara turirama*,
"they beat each other."

The only sign whether a pronoun is reflective or reciprocal is shown in the form of the verb—*vide* Chapter VIII.

There are only two Demonstrative Pronouns—

nana,	this.
nanatera,	these two.
nanirbera, nanankana	these.
tana,	that.
tanatera,	those two.
tanirbera, tanankana	those.

Instead of *tana* is also used, *nakuna* and *arina*, "that." Declined in the same manner as possessive pronouns.

There are also only two Interrogative Pronouns.

nguna, "who?" and *iwuna*, "what?"

Dual and plural formed like those in the demonstrative pronouns.

The only difference in the declension of these two is that the terminations of genitive, dative, and ablative cases, dual and plural, are inserted between the root and termination of the word, as—

Dual.

Gen.	ngukatera?	of which two?
Dat.	ngunanatera?	to which two?
Abl.	ngunangatera?	from which two?

Plural.

Gen.	ngukirbera? ngukankana?	of which?
Dat.	ngunanirbera? ngunanankana?	to which?
Abl.	ngûnangirbea? ngunanganka na?	from which?

The correct answer to the question, *ngula nana nilknalinaka?*
"who this stolen has?"
must be, *katjiala nana nilknalinaka*,
"the child this stolen has;"
not *katjia*, because steal is a transitive verb.

The questions, *nguna unta nama?* "who are you?", *nouna nana nama?* "what is that?", or *nana*, *iwuna*, *ntitja?* "this, what is it?", are answered, *jinga nama*, "I am;" and *nana*, *tana ntitja*, "this, that is it."

RELATIVE AND INDEFINITE PRONOUNS.

a. There are no Relative Pronouns in the language; they are expressed either by repetition of the demonstrative pronouns, *nana* and *tana*, as,

atua nala, nana tmurka albuka, worana tukala,
"man this, this yesterday went away, the boy has beaten,"
i.e., "the man who went away yesterday has beaten the boy;" or else by the participle of verb corresponding with the English participle, as,

ilupa tera, iltala mbakatnarakala, jiraka,
"axes two, on house were leaning, disappeared."
i.e., the two axes, which were leaning on the house, disappeared."

b. The Indefinite Pronouns are the following:—

arbuna and tueda,	another.
arbunatera,	two others.
arbunirbera and arbunankana,	others.
urbutjarbuna,	some others.
nkarba,	a few others.
tuedakatueda,	others.
nintamintnta,	one by one, each.

The declension of these is regular.

There are three pairs of Correlative Pronouns, used only in the nominative case:—

ntakina?	how, or in what way?
lakina,	thus, this way.
ntakinja?	how many?
lakinja,	so many.
ntakata?	how big?
nakakata,	so big.

CHAPTER V.

Of Adverbs, of Conjunctions and Interjections.

Derived adverbs, corresponding with English adverbs in "ly," are formed by adding the particle "la" to adjectives, as *era ekaltala erguma*, "he holds fast."

Others are—

a. ADVERBS OF TIME.

lata,	now.
lilika,	soon.
tmurka,	yesterday.
tmurkarbuna,	the day before yesterday.
ingunta,	to-morrow.
imanka,	long ago.
anma,	by and by.
ilangara?	what time?
kuta,	always.

Others will be found in the vocabulary.

b. OF PLACE.

nana,	here.
itinja,	near.
longa,	far.
ntala?	where?
ntauma?	whither?
ntananga?	whence?
nauna, arinuna,	thither.
arina,	there.

c. OF NUMBER.

ninta ranga, ninta ngara } once.
ntakinjaranga? how many times?
tera ranga, twice.
urbutja ranga, sometimes.

d. OF ORDER.

arugula, the first.
mbola, between.
inkana, the last.

e. OF QUANTITY.

njara, much.
kala, enough.
kurka, a little.
lakina, so.
ngera, like.
wota, more.

f. OF QUALITY.

monjala, slowly.
kuna, badly.
parpa, quickly.
mara, good.

g. OF AFFIRMATION.

tutna, certain, true.
wakuia, of course.
wa, wabala, } yes.

h. OF NEGATION.

itja, no, none.
gunia and lira, none.

Conjunctions.

This language possesses very few conjunctions. The majority are combined with the verb. There is not even a proper word for the copula, and the following are the only ones found :—

tuta, urungara, } too, also.
etalinja, yet.
bula, but.
wara, only.
ngetjina, as, than.
gurunga, then.
nta (suffix), only.

INTERJECTIONS.

aai !	"hear!"
apu !	"I am sorry."
erai !	"behold!"
tjikai !	"Ah!" calling attention.
tjikabai !	"woe."
nturbai !	"indeed, it is true."

CHAPTER VI.

OF TENSES, VOICES, NUMBER, AND MOODS OF VERBS.

There are three tenses. The present tense is indicated by the termination "*ma*" added to the root of the verb, as, *tuma*, "to beat." *Tu* is the root of the verb, but *ma* is the termination.

This also represents the Infinitive of the verb, there being no other form to indicate it, so that the meaning is, "I do beat," or "I beat."

The perfect tense is formed by adding the particle *ka*, or *kala* to the root of the verb, as, *tuka*, or *tukala*, "I have beaten." The first probably corresponds to the Imperfect and the latter to the Perfect, though the natives themselves cannot explain the difference.

There is still another form for the perfect tense, viz., *tjita*, as, *tutjita*, "I have beaten," which is very likely the Preterite, though it is difficult to determine the difference, as they have very little notion of time, and use often for remote time both forms, *ilkukala* and *ilkutjita*, which both mean "I have eaten," but leaves it undecided whether yesterday or a long time ago.

The future tense is formed by adding *tjina* to the root of the verb, as, *tutjina*, "I shall beat;" or, *ilkutjina*, "I shall eat."

OF VOICES.

The Active Voice signifies always an action executed by a subject, but this may be:—

a. Intransitive when it signifies an action remaining with the subject, as, *antata alknanbuma*, "the flower blooms;" or, *era lima*, "he goes."

b. Transitive when it signifies that the action is or may be transferred to an object in the accusative case, as, *ta kwatja njuma*, "I drink water;" or, *ta wora tukala*, "I have beaten the boy."

The Middle Voice signifies an action which the subject executes directly upon himself, as, *ta nukara tulama*, "I beat myself;" *ta nukara tulaka*, "I have beaten myself;" *ta nukara tulitjina*, "I shall beat myself." As will be seen, the sign of the middle voice form is inserted in the middle of the verb, consisting of the particle *la* or *li*.

The reciprocal form, which, of course, can only be with dual and plural, is known by the termination *rama* for dual and *rirama* for plural, as, *ilina turama*, "we two beat each other;" *anuna turirama*, "we beat each other."

A proper form for the Passive Voice does not exist, and it is expressed by putting the subject in active form and the object in the dative case, as,

atula worana tukala,
"by the man to the boy is beaten."
i.e., "the boy is beaten by the man."

OF NUMBER.

There are, as with nouns and pronouns, three numbers, *i.e.*, singular, dual, and plural. These can be distinguished by the termination of the verb, if unconnected with a pronoun. The pronoun being used the plural form of the verb may be omitted, as not being necessary to a clear understanding. There is no inflection on account of gender or persons, the latter being expressed by the pronoun. The termination of the dual of intransitive verbs is *rama*, of plural *rirama*; as, *jinga lama*, "I go;" *ilina larama*, "we two go;" *anuna larirama*, "we go." With transitive verbs the dual and plural are formed by using the intransitive verbs, *nama*, "to be;" and *lama*, "to go;" as auxillary verbs, as, *ta ilguma*, "I eat;" *ilina ilgula narama*, "we two eat;" *etna ilgula narirama*, or *etna ilgulta nama*, "we eat." The two expressions signify the same; but the latter is very likely a form of participle, so that the meaning would be "we are eating." It will be seen by this that the only difference is in using the participle, *la*, added to the root of the main verb.

The dual and plural in the Middle voice double the particle, *la*, as, *ilinakara tulala narama*, "we two beat ourselves;" *anunakara tulala narirama*, "we beat ourselves."

OF THE MOODS OF VERBS.

There are three chief moods—Indicative, Conditional, and Imperative. The form of the Indicative has been given already. The Conditional is formed by adding the termination, "*mara*," to the root, as *ta ilkumara*, "I should eat."

The Imperative is formed by the particle, *ai*, added to the root, as, *tuai!* "beat;" *ilgula narai!* "you two eat!" *ilgula narirai!* "eat you!"

Another form, signifying an order to do it quickly, is composed of the repetition of the root of the verb and the insertion of the particle, "*lba*," as *tulbatuai!* "beat quickly!"

Also belonging to the Imperative may be reckoned the following form:—

ta tuiai! "let me beat!"
anuna ilkula narireai! "let us eat!"

These chief moods, as well as the accessory ones, have almost all a double form—one for a positive and one for a negative sense—as,

Positive.	Negative.
ta tuma, I beat.	ta tutjikana, I beat not.
ta njuka, I drunk.	ta njutjimakana, I have not drunk.
ta gatjina, I shall cut.	ta gatjigunia, I shall not cut.

The other accessory moods are—I. The Participle, meaning doing, as doing, while doing, &c., formed by the particles: "*manga*," for present, "*mala*," for perfect, and "*tjinanga*," for future tense, as,

tumanga, while beating.
tumala, after beating.
tutjinanga, shall be beating.

II. The Supine is formed by the particle, *tjika*, as,

ta tutjika, to beat, or I must beat.
ta tutjika bitjima, I came to beat.
negative, ta tutjika nitjika,
I to beat must not, *i.e.*, I must not beat.

There is another similar form, difficult to designate, formed by the particle, "*mitja* or *kutja*," added to the root of verbs, as, *tumitja* or *tukutja*, probably an abbreviation of *tuma* and *itja*, "not," and of *tuka* and *itja*. The meaning of it is,

lai! ta ngana tumitja,
go! I you not beat!
i.e., go, that I do not beat you!

Connected with the participle perfect is another form, *tumal katana*, meaning seeming to be so, as,

Alinga airima limalakatana,
"Sun sees, going as if,"
i.e., "the sun seems as if he were going;" or,
Parpala limanga bira limalakatana,
"quickly when going, tree seem to go,"
i.e., "When quickly going, the trees seem to go."

CHAPTER VII.

Of Auxiliary Verbs.

Pure auxiliary verbs, as, to *be*, to *have*, *may*, *can*, &c., are not used as such, for the verbs in use for auxiliary verbs are not treated in the same way as in English. They act as absolute verbs as well; for example, *nama*, "to be," means also "to sit down."

There are only two used as auxiliary verbs proper: *nama*, "to be;" and *lama*, "to go."

In addition to these, there is a class of verbs used for different purposes, and in various manners.

I. To make out of intransitive verbs transitive ones, as, *kumerama*, "to arise or awake," is intransitive, but by omitting *erama*, and instead of this adding *lilama*, *kumililama* is formed, and it becomes transitive, with the meaning, "to wake or call up;" or again, *ntankama*, "to call," by adding the verb *lelama*, "to promise," it becomes a transitive verb, meaning "to save, to redeem."

II. To form verbs from substantives and adjectives, as, *inguia*, "old," by adding to this *erama*, "to see," it becomes an intransitive verb, "getting or becoming old" *(inguierama)*, though *erama* is originally a transitive verb; or to *atua*, "man," add *erama*, it becomes *atuerama*, "becoming a man;" or *tjeba*, "a piece," to this add *gama*, "to cut," thus, *tjebagama*, "to cut in pieces, to tear," &c. In similar ways are also used *wuma*, "to hear;" *ilama*, "to say;" *ankama*, "to speak;" *albuma*, "to go back;" *arinama*, "to put;" *ntema*, "to give;" *indama*, "to sleep;" *anbuma*, "to touch;" and many others.

Before passing to the original or main verb, a table showing the conjugation of an auxiliary verb will be given in full, as it occurs so frequently. The present tense is given in full, but further on only the first person of each number is taken.

See Table I., Appendix.

In the same way are treated all intransitive verbs.

CHAPTER VIII.

Of Transitive Verbs and their Conjugation.

The conjugation of the transitive verb is easy to comprehend, as it needs only the proper pronoun to be put in its proper place. Instead of further explanation it will be best to give a table showing the conjugation of the transitive verb *tuma*, "to beat," because it takes all tenses, moods, and voices, whilst others are more or less defective.

As will be seen by Table II., Appendix, only the first person has been given showing the conjugation of the reciprocal form. This is sufficient as the others are regular.

Where the negative conjunction *gunia* (meaning "no" or "none") occurs, there is no particular form used; neither is there one for the Participle future negative, the future of the Indicative negative being employed—*vide* Table I., Appendix. This is only the case with the regular conjugation of the simple verb. There are, however, an almost endless number of secondary notions connected and combined with the verb, which it is difficult to designate by any term. The natives combine almost everything

with the verb, which in English are expressed by adverbs of place, of time, of quality, of quantity, &c.

These combinations make the use of the verb a sort of labyrinth, through which it is a difficult task to follow or keep the clue. The following chapters will be devoted to putting these into classes, so as to render the subject as simple as possible.

CHAPTER IX.

Verbs Combined with the form "Tula."

This form "tula" is used with the conjugation of the absolute verb in the active as well as in the middle voice, but whether as a kind of supine or not, it is always used as a main verb.

The other forms combined with this form act as auxiliary verbs, and most of them are treated as in Table I., Appendix. They are the following:—*uma* or *wuma*, "to hear;" *nama*, "to be;" *lama*, "to go;" *albuma*, to return;" *ngama*, "to carry."

Then there are several others where only the form *tula* is either altered or elongated; these cannot be considered combined verbs, although they are contracted with particles or fragments of other words.

For the sake of a more distinct arrangement both will be considered in different paragraphs.

VERBS COMBINED WITH "TULA."

I. *Tula nama*, "to beat for a certain time constantly," which is expressed by the auxiliary verb *nama*, "to be" or "sit down;" so that the meaning of it is "I beat constantly or continually."

This verb is conjugated in all the moods and voices of Table I., Appendix, except Middle and Reciprocal, which adopt the conjugation of the absolute verb *tuma*, "to beat."

II. *Tula lama;* the literal translation is, "I go to beat," and it signifies an action in which the subject is in course of executing and has not yet finished, similar to the present participle. This verb can also be treated as I. As, however, the auxiliary verb *lama* cannot have a reciprocal form, the termination of this must be added or rather inserted for reciprocal meanings, as, *anunakara turirala lama*, "we are beating each other;" *anunakara turirala litjina*, "we shall beat each other," &c.

III. *Tula tula lama;* a reduplication of the former verb, and therefore meaning "to beat sometimes quickly or hastily." Treatment, the same as the foregoing.

IV. *Tula uma;* the literal translation would be, "I hear to beat," but the usual meaning is, "I beat once." This verb also takes all moods and voices of Table II., Appendix. The conjugation of these verbs can easily be formed, for the main verb, here *tula*, remains unchanged, and after omitting the termination *ma*

of the secondary verb, *una* or *wuna*, the terminations of the moods and voices are added to the root of the secondary verb, as shown in Table I., Appendix. Only two slight alterations exist, one in the reciprocal form, which runs thus, *ilinakara turala wurama*, "we two beat each other once;" *anunakara turala wurirama*, "we beat each other once;" and the other with the future positive as well as negative, where the form is not *tula utji gunia*, but *ta tulaunja gunia*, "I shall not beat once;" *ilina tula wurinja gunia*, "we two shall not beat once," &c.

Middle Voice: *nukara tulaunja gunia*, "I shall not beat myself once;" *ilinakara tula wuririnja gunia*, "we two shall not beat ourselves once."

Reciprocal: *anunakara turala wuririnja gunia*, "we shall not beat each other once."

v. *Tula albuma* or *tulalbuma*, meaning, "arrived at another place beating," or "arrived I beat." Conjugation similar to iv.

VERBS COMBINED WITH OTHER VERBS OR FRAGMENTS OF VERBS.

i. *Tulienama*: a peculiar form used before a following Supine, as, *ta tulienaka, erina ilutjika*, "I have beaten, that he died."

Active Voice: *Ta tulienama*, "I beat;" *ilina tuliela narama*, "we two beat;" *anuna tuliela narirama*, "we beat."

Middle Voice: *nukara tulalienama*, "I beat myself;" *ilinakara tulaliela narama*, "we two beat ourselves;" *anunakara tulaliela narirama*, "we beat ourselves."

Reciprocal: *ilinakara turalienama*, "we two beat each other."

Other forms obtained by annexing the terminations of Table II., Appendix.

ii. *Tulabuma*, "beating by walking about." The complete form for "to walk about" is *bala nama*; hence *tulabuma* is only an abbreviation of *tula* and *bala nama*. These abbreviations are very common in this language, and make it difficult to understand the real meaning of a phrase where this and other similar abbreviations are used. The conjugation is the same as in Table I. Appendix, for *buma* acts as an auxiliary verb.

iii. *Tulinja ngama*, meaning, "to beat always."

Conjugation as in Table I., Appendix.

The termination of Middle and Reciprocal Voices are inserted in or rather added to *tula*, as,

Middle: *nukara tulalinja ngama*, "I beat myself always;" *ilinakara tulalinja ngarama*, "we two beat ourselves always."

Reciprocal: *ilinakara turalinja ngama*, "we two beat each other always;" *anunakara turiralinja ngama*, "we beat each other always."

CHAPTER X.

Forms of Verbs Combined with the Supine.

In some of these combinations the Supine is easily distinguished, whereas in others it is abbreviated, the meaning showing its existence nevertheless. Again, it is sometimes combined with a simple verb, whilst in other cases it contains other particles. The literal translation is not in many cases absolutely correct, but still sufficiently so to lead to a right interpretation.

As there are only a few of these forms they will be considered *seriatim*.

I. *Tutjikalama*, evidently consisting of the Supine, *tutjika*, and the auxiliary verb, *lama*, "to go," literal translation would be "I go to beat," but the usual meaning is "I beat from above to beneath"—*i.e.*, downward.

II. *Tutjinjama*, where the termination *ka* of the Supine is omitted, and also the secondary verb is abbreviated from *intitjinjama* into *injama*, "to rise or ascend." The meaning of it is "I beat from beneath to above or upwards." However, this meaning is often altered in other verbs, as, for instance, *ilkuma*, "to eat," where *ilkutjikalama* means "to eat in the evening, to sup," and *ilkutjinjama* means "to eat in the morning, to breakfast." The conjugation of both is the same as shown in Table I., Appendix; and the Middle and Reciprocal forms are treated as *tulinja ngama* (see chapter ix.)

III. *Tutjika ma nitjikana*, or *Tutjikamanitjikana*. The particle *ma* receives a very extensive use in this language, as, for instance, *altamalta*, "day by day" or "daily;" *nintamininta*, "one by one;" *putamaputa*, "hill by hill" or "every hill." In the present case it means "again," so that the meaning is "I beat again not being"—*i.e.*, "I shall not beat again." The positive phrase "I shall beat again" they express by *tutjikantema*, where *ntema* means "again." Conjugation similar to above.

IV. *Tutjikerama*, "going to beat," is treated also in the same manner, as are also the two following:—

V. *Tutjilbitnima*, "come to beat," and,

VI. *Tutjalbuma*, "returned to beat.

VII. *Tutjigunala*, a somewhat different form, meaning "to beat by and by, not now." It is different, because, firstly, it is only a form of future tense; and secondly, its conjugation differs, as will be seen by the following:—*ta tutjigunala*, "I shall beat by and by;" *ilina tula narinja gunala*, "we two shall beat;" *anuna tula naririnja gunala*, "we shall beat."

Middle: *nukara tulala ninja gunala*, "I shall beat myself;" *ilinakara tulala narinja gunala*, "we two shall beat ourselves."

Reciprocal: *etnikara turirinja gunala*, "they shall beat each other."

VIII. There remain only two more of these forms to consider, and they are not really forms of verbs, but consist only of a particle annexed to the Supine, which then gives the verb another meaning. The first is *tutjikatjilala*, "that I may beat quite alone," as, *arbuna inkaraka ta jainama, nukara ilknilitjikatjilala*, "the others all I send away, that I may wash myself quite alone."

The other is *tutjikatjora* or *tutjikatanga*, both meaning "that I may beat.

Ex.: *era erina kwatjuna retingaka, ekurara ilknilitji-* "he him to the water led that he may wash
katjora or *tanga.* himself."

Neither can be brought into other forms.

CHAPTER XI.

Some other Forms of the Imperative.

Two of these have been seen already in Chapter VII., which can consequently be omitted here. But there are still some others, which have to be considered, but as there is neither any irregularity as regards conjugation, nor any difficulty in the form, they need only be specified as follows :—

I. tulatana ! beat !
tula naratana ! beat you two !
tula nariratana ! beat you !

II. tula nalgurai ! beat a little or slowly !
tula naralgurai ! beat you two a little !
tula nariralgurai ! beat you a little !

III. tualgurai ! beat quickly !
turalgurai ! you two beat quickly !
turiralgurai ! you beat quickly !

IV. tuarpa ! beat for certain !
tula nararpa ! you two beat for certain.
tula narirarpa ! beat you for certain !

CHAPTER XII.

Verbs combined with "tutna," and Derivations therefrom.

There are only two expressions with the original form "tutna," which seems to correspond to the Greek optative mood, for it means *to wish or desire to beat.*

The first is, *ta tutna*, "I wish to beat," and the other, *ta tutna nama*, "I would beat, being angry." There is no difficulty as regards conjugation, and they are treated in the same way as other verbs, the only differences being—

I. In the negative form, which runs thus: *ta tutna gunia*, "I do not wish to beat;" *ilina tula naratna gunia*, "We two do not wish to beat;" whilst in the other verbs it runs, *ta tutna nitjikana*, "I would not beat."

II. In the form of Middle and Reciprocal, where the first verb, "*tutna*," takes the general form: *nukara tulatna*, *ilinakara tula naratna*, &c., but the other verb, "*tutna nama*," is treated as shown by Table I., Appendix, viz., *nukara tulatna nama*.
ilinakara tulatna narama.

Reciprocal: *ilinakara turatna nama*, &c.

Another verb belonging to this class is, "*ta tuatnama*," meaning, *I beat only a little*.

Other verbs are altered similarly, as, *ta ilkuma*, "I eat;" *ta ilkutna*, "I wish to eat;" *ta ilkwatnama*, "I eat a little."

It is treated like the last-mentioned one, the negative form only being slightly altered, namely, from *tuatnitjikana* into *tuatninja gunia*, however, it is scarcely in use, for they express themselves then positively and say "I beat very much." All other tenses and moods of these are formed regularly.

From this last verb there are derived a number of other forms of verbs, which, as they present no difficulty as regards conjugation, being mostly treated like those above, need not be considered especially, but it will be enough to enumerate them and give the translation. They are the following:—

I. *ta tuatna lama*, "I beat arrived at another place."

II. *ta tualba nama*, "I beat sometimes arrived at another place."

III. *ta tuatnitnima*, "I beat continually."

IV. *ta tualbuntama*, "I beat running away."

V. *ta tuatnauma*, "I beat some."

VI. *ta tuatalalbum*, *ta tulbatuatnama*, *ta tuatilbuma*, all three meaning "returning homeward, I beat on the road" or "between another place and my home."

VII. *ta tuatnalbuma*, "come here" or "hither, I beat," meaning, of course, from the point or place the speaker is standing.

VIII. *ta tuatnilbitnilalbuma*, "returning come near my home, I beat"—*i.e.*, "almost returned I beat."

Of the two forms, *tuatilbuma* and *tuatilbitnima*, it is to be remarked that they are changed in the Middle voice into *tulatulalbuma* and *tulatulilbitnima*, and in the Reciprocal form into *turaturalbuma* and *turaturilbitnima*. The particle of the Dual and Plural, however, is inserted, as is usual, in the auxiliary verb, *nama* or *nima*.

There are, again, three other verbs which are connected with these, as will be seen by the translation—

I. *ta tuanjama*, "returning I beat on the road," which is in Dual and Plural of the Active as well as of Middle and Reciprocal connected with the auxiliary verb *lama*, as, *ilina tuanja larama*, *ilinakara tulinja larama*, &c.

II. *ta tuanjilbitnima*, "I beat shortly after started on road going home."

III. *ta tuanjilbuma*, "almost arrived at home I beat."

Both are regularly conjugated; the particle of the Middle *la* or *li* is added to the root of the verb, as *nukara tulinjilbitnima* and *tulijalbuma*.

There remain only two more forms to be mentioned, which have both one meaning, only the latter is augmented —

I. ta tunama.
ilina tunerama.
anuna turira nama.
Middle: nukara tula nama.
Reciprocal: ilinakara tura nama.

II. *tulbatunama*, "I beat going away quickly."

Corresponding with the latter is *tuatilbanama* or *ilkwalkilbanama*, "I beat or eat going away on the road.

CHAPTER XIII.

Sundry Moods and Forms not mentioned in Chapter VI.

There are some conditional forms which have to be mentioned here, as they are of frequent occurrence—

I. *ta tumalamikana namara*, I should not have beaten;

II. *ta tumaranga* or *tumalanga*, "I should have beaten;"

as, for example, *unta nala namanga*, *kalja nuka ilumalamikana namara*, "if you would have been here, my brother would not have died," *i.e.*, "if thou had'st been here my brother had not died."

The first can also be expressed by putting before the conditional mood the negative word *itja*, "no," as, *itja ilumara*, "had not died;" or by *tumalikananga*, as, *unta bitjimalikananga*, *kalja nuka ilumara*, "if thou hads't not come here, my brother would have died."

Again, the first form can be used without the conditional, *namara*, then meaning, "*not beaten*," or "*because not beaten*;" as, *era namalamikana*, *mandera inimalamikana*, "because he was not here, he got no shirt."

When a question is put to anyone else, the verb takes another form, as, *woka unta tuikana?* "Why you have beaten not?"

The same form can also have a conditional meaning, as, for example, *era ntaineikananga, ta ntainakala,* "because he has not speared, I have done so."

The same form without the termination of the participle, "*nga*," "*tuikana*," has again another meaning, as, *rula jinga entai, ta tuikana,* "give me a stick that I may beat," which is rather a form of optative.

Another form is *woka unta tumarpa,* or perfect *woka unta tukarpa ?* which is a prohibitive form, meaning, "what for you beat?" at the same time expressing, *it is not right to do so, and also that the speaker himself saw it, which we cannot express in one word at all.*

Finally, there are still to be specified some forms which are only either reduplications of the verb, or else augmentations. Such are—

I. "*Tutjinabuta tutjinabuta*," or "*tutnabutatunabuta*," both meaning, "I shall beat again."

II. *Tulinja tulindama*,, "to beat always;" *wulinja wulindama,* "to hear always;" *lalinja lalindama,* "to go always."

III. *tulinja mbura,* also signifying, "to beat always."

IV. *tulatulauma,* "to beat seldom;" *rualilalauma,* "to run seldom" (water in creeks), as, *mbonta rualilalauma* "The Finke runs seldom."

V. *tuma,* "I have finished beating;" *ilkuma,* "I have finished eating." The Negative is expressed by *tunikana* and *ilkunikana,* "I have not finished beating or eating."

VI. *bitjima,* "to come," but *bitjimalalkura,* "just arrived."

CHAPTER XIV.

Conclusion.

It is evident from the foregoing that the language of these Australian natives is by no means as simple as many are inclined to think. Certainly, as compared with the languages of other more intelligent races, it is to be called poor; but the chief cause of this is, according to my opinion, their isolation. Owing to the localities capable of supporting human life being so far distant from each other, it necessitates a division into very small fragments of tribes, each often consisting only of a few families. However, for objects that they can see and hear of in their daily life, they have words and expressions enough. Take for instance the verb, how many different forms they can obtain from a single verb! As seen by Table II., Appendix, they can form not less than 300 different phrases.

Now there are many forms, which have been considered in the foregoing chapters, which can be brought into all the moods and voices of Table II., Appendix. There are 30 at the least which can be thus regularly conjugated, that means, from one mood can be made 9,000 different phrases. There are others again which can only be used in some moods and tenses, forming about 600 phrases, so that 9,600 expressions may be derived from one mood, Certainly there are some verbs which cannot be conjugated regularly, but are more or less defective. For instance, "to eat" cannot have either a Middle or a Reciprocal form; but the transitive verbs generally can be brought into all moods and voices.

Those mentioned do not embrace all, but they are those mostly used.

These pages do not profess to give a complete grammar of the language, but merely such an outline as may give a general indication of its structure. There are many expressions related herein which would require a philologist to classify or properly arrange, and any hints in this direction would be thankfully received by the writer.

Though it is scarcely worth while learning the language of these tribes, as their number is small, and it would be much easier at once for a missionary to teach them the English language, yet how can this be done unless first their language is understood? For every English word must be first translated to them, if they are to properly understand it. Experience has shown that many of these natives can speak more or less English, but when questioned as to the meaning of words, they either are unable to answer, or else they give a wrong translation. For instance, a young man, who gave to all questions put to him the same stereotyped answer, "All right, my boy," most likely heard this expression once from a white man, and thought it would answer upon all occasions. This only shows how ignorant they often are about the expressions they use, and how necessary it is to learn first their language, though it demands a great expenditure of labour, which, however, carries its own reward in a better mutual understanding between teacher and pupil.

APPENDIX.

TABLE I.

SHOWING THE CONJUGATION OF THE AUXILIARY VERB, NAMA—TO BE.

INDICATIVE MOOD.

Present Tense.

POSITIVE.

Singular.

jinga nama—I am.
unta nama—thou art.
era nama—he, she, it is.

Dual.

ilina narama—we two are.
mbala narama—you two are.
eratera narama, they two are.

Plural.

anuna narirama—we are.
arankara narirama—you are.
etna narirama—they are.

NEGATIVE.

Singular.

jinga nitjikana—I am not.
unta nitjikana—thou art not.
era nitjikana—he is not.

Dual.

ilina naritjikana—we two are not.
mbala naritjikana—you two are not.
eratera naritjikana—they two are not.

Plural.

anuna nariritjikana—we are not.
arankara nariritjikana—you are not.
etna nariritjikana—they are not.

Perfect Tense.

POSITIVE.

jinga nakala—I have been.
ilina narakala—we two have been.
anuna narirakala—we have been.

NEGATIVE.

jinga nitjimakana—I have not been.
ilina naritjimakana—we two have not been.
anuna nariritjimakana—we have not been.

Future Tense.

POSITIVE.

jinga nitjina—I shall be.
ilina naritjina—we two shall be.
anuna nariritjina—we shall be.

NEGATIVE.

jinga nitjigunia—I shall not be.
ilina naritjigunia—we two shall not be.
anuna nariritjigunia—we shall not be.

CONDITIONAL MOOD

Present Tense.

POSITIVE.

Singular.

jinga namara—I should be.
unta namara—thou would'st be.
era namara—he would be.

Dual.

ilina naramara—we two should be.
mbala naramara—you two would be.
eratera naramara—they two would be.

Plural.

anuna nariramara—we should be.
arankara nariramara—you should be.
etna nariramara—they should be.

NEGATIVE.

Singular.

jinga namarela—I should not be.
unta namarela—thou would'st not be.
era namarela—he would not be.

Dual.

ilina nala naramarela—we two should not be.
mbala nala naramarela—you two would not be.
eratera nala naramarela—they two would not be.

Plural.

anuna nala nariramarela—we should not be.
arankara nala nariramarela—you would not be.
etna nala nariramarela—they would not be.

Perfect Tense.

Only one form for Present and Perfect.

Future Tense.

jinga nitjinala—I should be.
ilina naritjinala—we two should be.
anuna nariritjinala—we should be.
jinga nitjinala gunia—I should not be.
ilina naritjinala gunia—we two should not be.
anuna nariritjinala gunia—we should not be.

IMPERATIVE MOOD.

POSITIVE.

nai !—be !
mbala narai !—you two are !
arankara narirai ?—are you ?

NEGATIVE.

nitjala—be not !
mbala naritjala—you two are not.
arankara nariritjala—we are not.

SUPINE.

POSITIVE.

jinga nitjika—I must be.
ilina naritjika—we two must be.
anuna nariritjika—we must be.

NEGATIVE.

jinga nitjala nitjika—I must not be.
ilina naritjala nitjika—we two must not be.
anuna nariritjala nitjika—we must not be.

PARTICIPLES.

Present.

POSITIVE.

jinga namanga—I being.
ilina naramanga—we two being.
anuna nariramanga—we being.

NEGATIVE.

jinga nitjikananga—I not being.
ilina naritjikananga—we two not being.
anuna nariritjikananga—we not being.

Perfect.

POSITIVE.

jinga namala—I been.
ilina naramala—we two been.
anuna nariramala—we been.

NEGATIVE.

jinga namalikana—I not been.
ilina naramalikana—we two not been.
anuna nariramalikana—we not been.

Future.

POSITIVE.

jinga nitjinanga—I shall being.
ilina naritjinanga—we two shall being.
anuna nariritjinanga—we shall being.

NEGATIVE.

Wanting.

TABLE II.

SHOWING THE CONJUGATION OF THE TRANSITIVE VERB, TUMA, TO BEAT.

ACTIVE VOICE.

INDICATIVE MOOD.

Present Tense.

POSITIVE.

Singular.

ta tuma—I beat.

Dual.

ilina tula narama—we two beat.

Plural.

anuna { tula narirama, / tulta nama, } we beat.

NEGATIVE.

Singular.

ta tutjikana—I beat not.

Dual.

itina tula naritjikana—we two beat not.

Plural.

anuna { tula nariritjikana, / tulta nitjikana, } we beat not.

Perfect Tense.

Singular.

ta tukala—I have beaten.

Dual.

ilina tula narakala—we two have beaten.

Plural.

anuna { tula narirakala, / tilta nakala, } we have beaten.

NEGATIVE.

Singular.

ta tutjimakana—I have not beaten.

Dual.

ilina tula naritjimakana—we two have not beaten.

Plural.

anuna { tula nariritjimakana, / tulta nitjimakana, } we have not beaten.

Future Tense.

POSITIVE.

Singular.

ta tutjina—I shall beat.

Dual.

ilina tula naritjina—we two shall beat.

Plural.

anuna { tula nariritjina, / tulta nitjina, } we shall beat.

NEGATIVE.

Singular.

ta tutjigunia—I shall not beat.

Dual.

ilina tula naritjigunia—we too shall not beat.

Plural.

anuna { tula nariritjigunia, / tulta nitjigunia, } we shall not beat.

CONDITIONAL MOOD.

Present Tense.

POSITIVE.

Singular.

ta tumara—I should beat.

Dual.

ilina tula naramara—we two should beat.

anuna { tula nariramara, / tulta namara, } we should beat.

NEGATIVE.

Singular.

ta tumarela—I should not beat.

Dual.

ilina tula naramarela—we two should not beat

anuna { tula nariramarela, / tulta namarela, } we should not beat

Perfect Tense.

Wanting.

Future Tense.

POSITIVE.

Singular.

ta tutjinala—I shall perhaps beat.

ilina tula naritjinala—we two should beat.

anuna { tula nariritjinala, / tulta nitjinala, } we should beat.

NEGATIVE.

Singular.

ta tutjinala gunia—I shall perhaps not beat.

ilina tula naritjinala gunia—we two should not beat

anuna { tula nariritjinala gunia, / tulta nitjinala gunia, } we should not beat.

IMPERATIVE MOOD.

POSITIVE.

Singular.

tuai—beat.

Dual.

tula narai—you two beat.

Plural.

tula narirai, / tulta nai, } beat you.

NEGATIVE.

Singular.

tutjala—beat not.

Dual.

tula naritjala—you two beat not.

Plural.

tula nariritjala—beat you not.

Supine.

POSITIVE.

Singular.

ta tutjika—I must beat.

Dual.

ilina tula naritjika—we two must beat.

Plural.

anuna {tula naritjika / tulta nitjika} we must beat.

NEGATIVE.

Singular.

ta tutjika gunia—I must not beat.

Dual.

ilina tula naritjika gunia—we two must not beat.

Plural.

anuna tula nariritjika gunia—we must not beat.

PARTICIPLES.

Present.

POSITIVE.

Singular.

ta tumanga—I am beating.

Dual.

ilina tula naramanga—we two are beating.

Plural.

anuna {tula nariramanga, / tulta namanga,} we are beating.

NEGATIVE.

Singular.

ta tutjikananga—I am not beating.

Dual.

ilina tula naritjikananga—we two are not beating.

Plural.

anuna {tula nariritjikananga, / tulta nitjikananga,} we are not beating.

Perfect.

POSITIVE.

Singular.

ta tumala—I was beating.

Dual.

ilina tula naramala—we two were beating.

Plural.

anuna {tula nariramala, / tulta namala,} we were beating.

NEGATIVE.

Singular

ta tumalikana—I was not beating.

Dual.

ilina tula naramalamikana—we two were not beating.

Plural.

anuna tula nariramalamikana—we two not beating.

Future.

POSITIVE.

ta tutjinanga—I shall be beating.

ilina tula naritjinanga—we two shall be beating.

anuna { tula nariritjinanga, / tulta nitjinanga, } we shall be beating.

NEGATIVE.

Like Future in Indicative Mood.

Middle Voice.

WITH SOME RECIPROCAL FORMS.

INDICATIVE MOOD.

Present Tense.

POSITIVE.

Singular.

nukara tulakna—I beat myself.

Dual.

ilinakara tulala narama—we two beat ourselves.

Plural.

anunakara tulala narirama—we beat ourselves.

etnikara turirama—they beat each other.

NEGATIVE.

Singular.

nukara tulitjikana—I beat myself not.

Dual.

ilinakara tulala naritjikana—we two beat ourselves not.

Plural.

anunakara tulala nariritjikana—we beat ourselves not.

etnikara turiritjikana—they beat each other not.

Perfect.

POSITIVE.

Singular.

nukara tulakala—I have beaten myself.

Dual.

ilinakara tulala narakala—we two have beaten ourselves.

Plural.

anunakara tulala narirakala—we have beaten ourselves.
etnikara turirakala—they have beaten each other.

NEGATIVE.

Singular.

nukara tulitjimakana—I have not beaten myself.

Dual.

ilinakara tulala naritjimakana—we two have not beaten ourselves.

Plural.

anunakara tulala nariritjimakana—we have not beaten ourselves.
etnikara turiritjimakana—they have not beaten each other.

Future.

POSITIVE.

nukara tulitjina—I shall beat myself.
ilinakara tulala naritjina—we two shall beat ourselves.
anunakara tulala nariritjina—we shall beat ourselves.
etnikara turiritjina—they shall beat each other.

NEGATIVE.

The Negative is formed by adding "gunia," as,
nukara tulitji gunia, &c.

CONDITIONAL MOOD.

Present Tense.

POSITIVE.

Singular.

nukara tulamara—I should beat myself.

Dual.

ilinakara tulala naramara—we two should beat ourselves.

Plural.

anunakara tulala nariramara—we should beat ourselves.
etnikara turiramara—they should beat each other.

NEGATIVE.

"gunia" to be added to the positive.

Perfect wanting.

The Present Tense used instead.

Future.

Singular.

nukara tulitjinala—I shall beat myself.

Dual.

ilinakara tulala naritjinala—we two should beat ourselves.

Plural.

anunakara tulala nariritjinala—we should beat ourselves.
etnikara turiritjinala—they should beat each other.

NEGATIVE.

Formed by adding "gunia."

IMPERATIVE MOOD.

POSITIVE.

Singular.

unkwangara tulai !—beat yourself !

Dual.

mbalakara tulala narai !—you two beat yourselves !

Plural.

aragankara tulala narirai !—beat yourselves !
aragankara turirai !—beat each other !

NEGATIVE.

Singular.

unkwangara tulitjala !—beat not yourself !

Dual.

mbalakara tulala naritjala !—you two beat not yourselves !

Plural.

aragankara nariritjala !—beat not yourselves !
aragankara turiritjala !—beat not each other !

Supine.

POSITIVE.

Singular.

nukara tulitjika—I must beat myself.

Dual.

ilinakara tulala naritjika—we two must beat ourselves.

Plural.

anunakara tulala nariritjika—we must beat ourselves.
etnikara turiritjika—they must beat each other.

NEGATIVE.

With "gunia" added.

PARTICIPLES.

Present.

POSITIVE.

Singular.

nukara tulamanga—beating myself.

Dual.

ilina tulala naramanga—we two beating ourselves.

Plural.

anunakara tulala nariramanga—we beating ourselves.
etnikara turiramanga—they beating each other.

NEGATIVE.

Singular.

nukara tulitjikananga—I not beating myself.

Dual.

ilinakara tulala naritjikananga—we two not beating ourselves.

Plural.

anunakara tulala nariritjikananga—we not beating ourselves.
etnikara turiritjikananga—they not beating each other.

Perfect.

POSITIVE.

Singular.

nukara tulamala—I was beating myself.

Dual.

ilinakara tulala naramala—we two were beating ourselves.

Plural.

anunakara tulala nariramala—we were beating ourselves.
etnikara turiramala—they were beating each other.

NEGATIVE.

Singular.

nukara tulamalikana—I was not beating myself.

Dual.

ilinakara tulala naramalamikama—we two were not beating ourselves.

Plural.

anunakara tulala nariramalamikana—we were not beating ourselves.
etnikara turiramalikana—they were not beating each other.

Future.

POSITIVE.

Singular.

nukara tulitjinanga—I should beat myself.

Dual.

ilinakara tulala naritjinanga—we two should beat ourselves.

Plural.

anunakara tulala nariritjinanga—we should beat ourselves.
etnikara turiritjinanga—they should beat each other.

NEGATIVE.

Expressed by adding "gunia" or "itja."

VOCABULARY.

A

aai (interj.), hear !
abula, somewhere else
agala, pale
airima, to see
airilalabuma, to look round, look about
akutnama, to lift the arm for beating
albula, till
albolja, very old
ala, the nose
alama, the liver
alatjura, nostril
alaurba, the bone of the nose
albanata, cloudy, dark
albalbaka, first part of the summer
albantiuma, to throw abroad
albara, young, healthy
albmelama, to answer, to tell
albuma, to return
algabma, poor, meagre
algala, pale
algara, green-shining like emu eggs
alinama, to be taken with convulsions, dying
alinga, the sun
alinja, the tongue
alinta, flame
alkanama, alkanalama (refl.), } to vomit
alkaralkara, shining, clear
alkielba, transparent
alkira, bright, not cloudy
alkirabinjanga, high
alkna, eye
alknagoda, eyeball
alknailpula, eyelash
alknajinba, eyelid
alknajunta, the orbit
alknalginja, awake
alknanbuma, alknalgama, } to bloom, to flower
alknalanbanama, to look angry
alknalurara inbuma, to overlook
alknatuma, to burn
alknaltara, clean, clear
alknatera, public
alknanterama, to torment
alknaralama, to look backward
alknatera airima, to see the thing itself
alknantangera, like fire
alknanta, blood-thirsty
alknanta, the temple
alknenera, a beetle
alknenta, sideways
alknentama, to look sideways
alkniltera airima, to squint
alkningera, eyebrow
alknira, evening
alknolja, tears
alknortja, embryo
alknotna, jealous
alknultinkama, to drown
alkultakakulterama, to feel disgust
alkura (comp.), more
alta, daylight
altagatjagatja, moonlight
altabatera, twilight in the morning, daybreak
altagalta, free
altalinama, altalinanama } to snap
altama, to pull out (feathers)
altamalta, daily
altarama, to find
altjiuma, to flow over
altjura, a hole
altola, west
altolakwa, western
alua, blood
alululama, to bleed
ambarinila, immediately
ananta, exhausted
anbuma, to touch with the hand
anbalanbalama, to enquire, to investigate
anbaela, anbara, } then, there on
andera, fat
angnera, the face
angna, seed, fruit
anjua, nest
ajua, an old man
anka, green, unripe
ankalabum, to hum (as insects)
ankama, to speak
ankaratjauma, to revolve
ankatauma, ankatalama, } to turn round, to whirl
ankataritjalama, to turn himself round
ankatala, thirsty
ankatamea, a drink
ankata, the cloud
ankatiuma, to roll
ankatja, language, sound
ankielta, guest
ankua, sleepy
ankuerama, to go to sleep
ankuindama, to sleep
ankurilama, to be contented

anma, in a long time
anmangaletakata, long living
antaka, wide, broad
antakira, south
antakirakwa, southern
antakerama, to become wide
antangalama, to stray, to lose himself
antanama, antalabuma, } to steal upon
antata, flower
antina, opossum
antjitataka, joyful together
anuna, we
apma, the snake call
arailama, aroitama, arilberitjama, } speaking low, to whisper
arailabuma, to look after or round
aralbuma, to evaporate
araltama, to forbid
arankama, to cry, to scream
araltagama, to cut, to prune
aranbouma, to mock
arankara, you
aragankara, yours
aratja, aratna, } straight, right, true
araltutjaltutja, bold, daring
aranta, tired
arabmaramara, the palate
aranga, grandfather
aragata, mouth
ara, wrath
aragutja, woman
aralitja, a stick
arankaia, palmtree
aramatula, a parrot's bill
aranbilama, to distribute
aranjikama, to challenge
arauna lama, to go to enemies
aranelilama, to greet, to salute
arartilama, to defend
aratalila nama, to lead out
ararama, to choose, to select
araratala tuma, to punish
arartankama, to defend with words, to excuse
araierama, to long for
aratama, aratinjama, } to arise (as the sun)
aratinjalama, to come or go out
arbarmaninja, in some time
arbalama, to know not
arbmanama, to create
arbmanarinja, Creator
arbmaninja, creature
arbunarba, that
arbukarba, those
arbuntarpa, obstinate
arbuna, arbukarpa, } another
arbuma, to hew, to trim
aregna, name
arelbilama, to sharpen, make sharp
arelguma, to compel
areola, outside
arelba, sharp
arenka, too quick
areratna nama, to make angry, to vex
arerama, arilerama, } to become angry
areba, albara, } wooden tray
argalaworkala nama, to poison
argana, joy, pleasure, play
arganabiljabilja, kind, smiling
argana, joyful, glad
arganabutanga, very joyful
arganerama, to become glad
arganilama, to make glad
argulargua, owls
argutilama, to hear, to hear over
arina, there
arita, solid, firm
arilabatia, eatable
arilamata, sandy
arinta, angry
arilljirka, a sucker on trees
arila, sand, earth, land
arilarkna, clay
arilinga, the jaw
arinbinba, the lip
ariljitna, arilatna, } the lungs
arilanbuma, to quarrel, to dispute
arilerama, to decay
arinama, to put
arinilanama, to put
arilgama, becoming day
arkanama, to taste, to try
arkaninjagaba, taste
arknamanalama, to agree
arknantaiuma, to protect
arknanterama, to hold up
arkatnia, industrious
aroa, rock-wallaby
arotuma, to press
artata, hard, firm
artjarerama, to determine
artjanbuma, to stamp with the feet
artjilanama, artja nama, } to depart, to go away
arugula, first
arungulta, poisonous

aruilkara, a white cockatoo
aruñama, to beat an innocent one
atanja, in spite of
atmunka, rats
atna, dung
atnindurka, the rectum
atua, a man
auma, to hear

B

babuterama, to cease
babauma, to catch, infect (sickness)
bailka, a bag, the bark of trees
bailkiuma, to strip off the skin, to bark
bailbilama, to lose
bakana, finished
bala nama, to walk about
bala lama, to stray
balaka, content
bala, wrong
balkala, in vain, useless
balkama, to bleach (flowers)
balatama, shy, timid
balaka, improvident
balka, pale
balia, distant
balba-barbuta, strange, indistinct
balera nama, to go astray
balkala ntema, to give to the wrong one
balkara, blue dove
balteratjata, slippers worn to conceal trail
batula, the pouch of kangaroos
balupa, the shoulder
baluka, bread
banama, to build, to paint
banalama, to paint himself
bangerama, to become blind
banga, blind
banba, everywhere
bania, small-pox or measles
banta, bakala, } wooden trays
barkuma, to assist, to help
baritjulba, mushrooms
bara, a tail
baeta, the tail of a snake
bartja, shining
bartjima, to shine, to glare
bataba, peaceable
batakerama, to turn (wind)
batakilama, to instruct
batalilama, to show the road, to call back
batakilama, to remember, to recollect
batalilama, to bend the knees
baterama, to go backward, to turn away
batama, cannot
bateatapa, impossible
bauma, to thrust, to knock down
bebilama, to calm, to quiet
belkua, again
benja, a spring of water, permanent water, salt-water
bira, red gum-tree (eucalyptus)
birka, charcoal
bitjima, to come
bitjalbuma, to come back, to return
boanka, breath
boankama, to breathe
bokarabokarerama, to stagger, to tumble
bola, saliva
boliuma, to spit
boilama, to blow
borerama, to be ashamed
borilentama, to flash
bota, a ball
bolda, a blister
botera, short
bora, shameful, sorry
borka, tired
bonta, blunt
bokarabokara, boggy, swampy
botilama, to make balls
boterama, to drain (water)
bula, but
bulknala, immediately, directly
bulja, loose, soft (sand)
bulkna, without intention
buka, perhaps, likely
bultabulterama, to get full of bladders
bultingama, to burst asunder
bultinjirkerama, to perish by thirst
bunabuna, empty
bunabunerama, to cover with dust

D

dalbadalba, shells, mussel-shells
dama, to grind (between two stones)
damba, loose, breakable
dana, cold
dantama, to close, to shut
datilama, to make wet, to moisten
data, wet, moist
data, soon
datagunama, to conquer, to overwhelm
deta, detja, teeth
detalura, the gums
debadeba, birds

dirkadirka, green (colour)
dolta, tired
dolka, low, horizontal
dotadota, short
dolterama, to become tired
dueda, another
dueterama, to change, to make a mistake
duetagudeda, different ones

E

eamitja, a deep hole
ebminja, useless
ebminjerama, to become useless
ega, scab, scurf
egunja, ashes
egnakalinga, different, unequal
egnarbegnarba, from all directions
egnagegna, single
egna, alone
egnagegnilama, to separate, to unfold, to make asunder
egutnanama, to catch up
ekaltilama, to fix, to make firm
ekalta, strong, firm, powerful
ekaltanumerumera, very strong, almighty
ekna, very sick, stiff
eknira, east
eknirakwa, eastern
eknakarinja, family
ekunama, to fetch
eknuma, to marry
ekarama, to dress
ekura, his
ekuratera, there are two
elgata, hill, mountain, ridge
enkua, almost, nearly
enta or anta (suff.), only
era, he
eratera, they two
erama (aux. verb), to become
eraginja, chaste
erapera, bent backwards
eraitinga, the comb of birds
eranbutinama, to circulate (reports)
erabukama, } to go round any-
erabakanama, } thing
eraganama, to hunt
erankerama, to grind with the teeth, being in wrath
ererentama, to borrow
erauia, weapons
erguma, to hold, to keep
erilkna, dead
erinta, cold
erila, man
erilknabata, ancestors
erinja, devil
eritja, eaglehawk
eritjinta, the Southern Cross
eroutja, an ulcer, an abscess
eroaltjatuma, to revenge
eroanberama, to disperse (clouds)
eroatja, light, cloudy
erora, young, fresh
erouma, to tremble, to shiver
erunjutna, dark, overcast
erunja, liberal, munificent
eruntarerama, to go out of the way
erukanerama, to get excited
erukanilama, to excite
erunjauma, } to tremble (in general)
erakama, }
eta, the throat
etakama, to flee, to run away
etaliralabuma, to remember
etalingetala nama, to understand
etalingetala, reason
etama, to make fire
etalirama, to recolleet
etaeta, stupid
etalinga, yet, in spite of
etapatikana, far away
etatja, slanting
etatagia, dangerous
etatnama, to choke, to strangle
etata, alive
etera, the shore
eterama, to become deaf
etna, they
etnetnauma, to tell, condemn, or curse
etnika, their
etopala, outside
etopa, a belt
etopatopa, an edge
etopalerguma, to gird
etopalergulama (refl.), to gird
etuanama, } to mince (meat)
etuilama, }
etuaratuarabenama, to boast
etulbmerama, to be suffocated
etuna, very warm, hot
etuanga, bold, courageous
ewolama, to lean against

G

gabmara, the top of the head
galagala, mistaken
galagalerama, to be on or go a wrong way
galtja, wise, knowing
galtjerama, to become wise to teach
galtjentama, to make wise, to teach
gama, to cut

galkata, the bud (of flowers)
gamba, delicate, well-tasting
galtjentanentana, a teacher
gara, meat
garra, clay-ground
garilkama, to cry out, to weep
garknanteulama, to penetrate
garalima, to expect something or someone
gartja, sharp, cutting
gata (suff.), with
gatala, outside, open, clean
gatairima, to look into
gatilama, to make open, clean
gataterilama, to cut off
gaterinama, to begin, to start
gaualama, to swing
gninama, to lend, to borrow
gnama, to dig
gnagnignama, to dig deep
goda, an egg
godna, ignorant, unwise
gola, hair, long hair
goltama, to cover, to protect
goltalama (refl.), to cover himself
guierama, to wink, to make a sign
gulelberama, to get stiff
gulatja, ornament for the neck
gultja, ornament for the arm
gunama, to put into
gunbanama, to be lazy, idle, innocent, not active
gunba, lazy, idle, not active, innocent
guruna, the soul
gutaka, left hand
gurunga, gurungatjina, } then, after that
gurknalilama, to forbid

I

ibatja, milk
ibatjangna, breast (of females)
ibarkna, the pleura
ibinja, a stranger
idunta, the stomach
ikala, dough
ikalilama, to make tough
iknima, to fall, to fall off
iknitjikalama, to fall down
ilalima, to offer
ilama, to say
ilangara, what time?
ilbangintala, obstinate, disobedient
ilbaleala, safe, saved
ilbirtja, gray
ilbatjaltjura, willing, obedient
ilbminta, powerful
ilbakutaka, willing, industrious
ilbarurtmurka, inaudible
ilbunkara, not smeared with fat or colour
ilbarilbera, shortly before evening
ilbanama, to accuse
ilbarinama, to teach, to tell
ilbararanama, to hang up
ilbankama, to know
ilbaleala nama, to be safe
ilbaiuma, to doubt
ilbmarawuma, to babble
ilbamba, a carcass
ilbirba, large leaves
ilbula, small leaves
ilbminta, power, strength
ilba, the ear
ilbatopa, the ear-lap
ilbanta, general rain
ilbmara, dew
ilbalunga, intia, } a cave
ilelilalama, to paddle, to dabble
ilgaia, the cheeks
ilgagama, to outwit
ilgarkama, to be frightened or alarmed.
ilganama, to sift, to winnow
ilgulilgulalama, to walk about
ilgulelgua, in all directions
ilgaginja, cunning, sly
ilga, quiet, settled
ilitja, green, unripe, under-done (meat)
ilelalbuma, to dictate
ilimbina, a leader, hero
ilia, an emu
iliapa, feathers of emus
ilirtja, a furrow, a trench
ilinja, a song
ilima, to sing
ilina, we two
ilirtjilama, to burst through (water)
ilingauma, to twist
ilkagama, to call attention to
ilkama, to call or cry out
ilkatjintama, ilkatnatjintama, } to crow
ilkaterama, ilkatinjama, } to ache
iltaratuma, to knock at (a door)
iltama, to quarrel
iltarba, sorry, sorrowful
iltjakiltjirka, ugly
iltjanja, beefwood
iltja, the hand
iltjaganja, the finger
iltjerama, to rest

ilulama, to dress out, to undress
ilulinjalama, to climb down
ilunama, to extinguish (fire)
iluma, to die, to go out (light)
iluma, to dry up (water)
imalalguia, imalalkura, in great danger, unsafe
imanka, long time before
imankinja, very old
ima, condemned to die
imanama, to hand over to, to offer
imaralama, to dash (small waves)
imatoalima, to dash (large waves)
imateuma, to roll up
imambula, danger
imbara, a sign, track, annual rings of trees
imbulkna, a scar, a mark
ilkata, pain
ilkapala, full (moon)
ilkatilama, to cause pain
ilknariuma, to skin
ilknima, to wash, to wipe away
ilknagama, to force away
ilknuinama, to castrate
ilknilbiknima, to stagger
ilkwaterilama, to help, assist, to accompany
ilknakama, to divide, to separate
ilkwatera, assistance, companionship
ilkankula, storm
ilknira, naked, poor
ilkaunkuanta, quick
ilkna, wet, moist
iloutja, miserable
ilotuma, to throw down
ilpanama, ilpulangalama, to fly
ilta, a hut, a house
iltariuma, to crack
iltarkama, to rattle
iltarkalilama, to make a rattling
iltirbminjatuma, to beat time
ilulitijikatjila erauma, to tremble with age
imbaninbana, cautious
imbanintuma, to have pity
imbuma, to let, to permit
imbulama, to leave (act)
imbalalbuma, imbalalama, to forsake, to leave
imilama, to condemn
impanama, to sift
inola, a spider
inalbuma, to take back
inanga, the arm
inara, patiently
inankala, wise, knowing
inbanama, to pass or go over
inbora, heavy
inbotna, hail-stones
inbirka, centipede
indota, clever
indora (superlative), very
indotilama, to adorn
indaltja, grasshoppers
indama, to lay down, to belong
ingalama, to beget
ingama, to roar (as animals)
inguia, old
ingutnala, in the morning
ingunta, to-morrow
inguntarbuna, the day after to-morrow
ingua, night
inguarinja, inguarakwa, a night walker
ingartja, a deep track
ingununga, maggots
inilalama, to get
ininga, beard
inima, to fetch
injakarilama, injakarauma, to load upon
inkanja, shoulder
inka, the foot
inkatnita, the sole of the foot
inkaganja, the toe of the foot
inkalura, a hoof
inkarinka, a ladder
inkanja, a prayer
inkainama, to erect
inkariknima, to run out (water)
inkailalama, to fly up
inkama, to beg
inkalerama, to look angry, to become wicked
inkirililama, to make noise
inkanindama, to commit adultery secretly
inkutilama, to bend
inkantama, to follow the track, to track
inkaraka, inkana, all
inkana, (also meaning) the last
inkilja, wicked, ugly
inkara, safe, without danger
inkutinkuta, crooked, bent
inkarinkara, slender, thin
inkarinjaka, altogether
inmanmaraulama, to shake the head
inmara, waves, mistletoe
intitjera, frogs

intjaginja, poison tooth, the Magellan clouds
intoala, honey
intitja, sacrum
intalinja, Scripture
intalingagata, painted, coloured
inturka, fearless
intita, stink
intira, quick
intjirka, dry (grass)
intarinja, untransparent
intjaka, away
intitjinjama, to arise (smoke)
intjamauma, to unfold
intalelama, to write, to make signs
intarama, to snore
intjakalama, to go away
intarinjilama, to unite, bring together
intitakerama, to mimic
intitakerama, to speak for one
intunama, to fell (a tree)
intarerguma, to couple together
ipitalukaluka, rough, uneven
ipita, deep
irala, cast-off skin of a snake
iranta, black cockatoo
irakira, a sign
irbaltangirbalterama, to dare
irbunga, fishes
irbuma, to set (sun), to dip under water
irbukalalama, irbunama, irbunjama, } to go into
irboterama, imbulknerama, } to recover from sickness
irbanjairima, to look into
irbonba, all gone, doubtful
irbota, peaceful
irbonberama, to cease giving away
iregerirlama, to make ashamed
iregerirama, to be ashamed
irgarama, to scrape
irgungalalama, to pass over close by
irgapa, desert-oak *(Casuarina Decaisneana)*
irgua, pus
irgalanga, a skeleton
irgalla, a knife made of stone
irgatagama, to smart the eyes (as by smoke)
irgaiilama, to blind the eyes (as by the sun)
irgaia, invisible
irkwanta, courageous
irkitjawama, to spin
irknala, bark of trees
irkitja, worsted, a string
irkna, the husk of seeds
iroamba, disappearing, temporary
itangurula, the same number, equal
itaka, loose, shaking
itarinama, to catch
itaringama, to lead
itarinama, to pull, drag, or tear
itatjata ntema, to give again
itia, younger brother or sister
itiinjara, brothers and sisters
itinjalama, itinjanama, } to overtake (running)
itinja, there, close by
itinja, close at hand, very close
itja, no, none
itnima, to weep
itnora, shy, afraid
itoa, wild turkey
itapmara, the nails of the fingers and toes
iwupa, the web of a spider
iwuna, what?

J

jara, ants
jaramba, edible eggs of ants
jabera, pieces of bark to play with
jalta, coal
jainama, to send
jarauma, to peel
jalama, to think, to mean
jarinama, to bring thither
jakularilama, jabajaberama, } to enquire
jaralama, to search for
jakmama, to look at in astonishment
jakama, jakalilama, } to persuade
jartja, without branches
jalknajalkna, very bright
jalbajalba, with long hair
jana, and anka, cannot hear
jatama, to be frightened
jealbmelama, to give notice, to betray
jerentama, to exchange
jeriuma, to scrape off
jia, message
jinba, skin
jibunakana, a liar
jirira, north
juntama, to search
jibalilama, to deceive
jibarinama, to abnegate, to excuse
jibarinalama, to deny, to excuse himself
jinima, to bind

jinilama, to refuse
jilbainama, to twist round (as snakes)
jibuma, to lie
jirama, to cease
jiranama, to disappear
jitalilama, to bend
jinga, I
jirkna, spiteful
jirirakwa, northern
jotia, heavy
juka, I don't know (probably an abbreviation)
jurka, bridle

K

kata, father
katailtja, one's own father
katalira, foster-father
kantirkna, the breasts of girls
kanta, ice, cold
kantakanta, round, a ring
kankinja, love, kindness
kankanankana, a lover
kankinjaka, kankalta nama, } beloved
kaluka, a ram, bull
kakuta, a sort of hat
kaputa, the head
kakalala, white cockatoo
kabiljalkuna, pelican
kabuluma, to break, or make open
kabanentantema, to give gratis
kabia lima, to walk softly
kakabanama, to announce or give notice
kalkukalama, to halt, to limp
kankama, to love
kantatuma, to fix, to fasten
kankuerama, to obey
kantanama, to twist
kanjalbuma, to make a spear
kangalangalerama, to drown
karuntama, to dance, to stamp with the feet
katelanama, to close the eyes
katnalilama, to bring anything high up, to erect
katauliuma, to throw outside
katanairima, to look outside
katitjalama, to roll
katjikatjilama, to tickle
katjiamalkura, childish
kuralja, katitjina, } Orion (stars)
kana (the negative particle)
kala, enough
kankia, idle, lazy
kankinja, kind
katna, above
katninga, over, upon
katnantupa, katnanta, } against
kara, awake
keltja, a half, a piece
keltjilama, to halve
kieka (suff.), on, upon
knira, large, big, very
knota, whole
knirinjara, very much, very many
knirerama, to become big
knuerama, to forget
konja, sad, sorry, mournful
kokuma, to bite
kokitjagama, to embrace
konjerama, to become sad or sorry
konjilama, to make sad or sorry
kotjima, to gather
kotikama, to take down
kulkura, sweat
kumerama, to rise or wake up
kumeralama, to arise from bed
kumililama, to awake
kumalilanjalbuma, to fetch round
kumia ntjainama, to smell sweet
kunerama, to become bad
kunabinjalama, to charm
kurkerama, to become small
kubitjakubitjalama, to dash in pieces
kuterama, to remain
kutetalirama, to keep in remembrance
kurka, little, small
kuta, always
kumia, sweet (water, of good taste)
kuna, bad, sin
kumalinga, never
kwana, inside
kwaninguna, to set aside
kwanginga, left hand
kwatjakwatja, liquid
kwamalaria, safe, without danger
kwanama, to swallow
kwaniralakalima, to plunge into water
kwarinama, to hear or attend to
kwatjenkama, to thunder
kwatja, water, rain
kwatjaluralura, heavy rain
kwatjatnoatnoa, light rain
kwara, girl
kwatjambenka, a water-flood
kwatjabara, lightning
kwenja, protection

L

la, lela (suff.), in, on, by, with, upon
labalilama, to roll into
labulbarerama, to die by starvation
lainama, to shake off
lainkerama, to fly away
lalknilama, to make ready
lalerama, to threaten
lalilama, to bring forth
lalerutnuma, to mix, to unite
lalama, to reject, to repulse
lamaknirilama, to be in debt
lanalabuma, to earn, to gain, to deserve
lanalama, to burst
lankarama, to know, to perceive
lankama, to blame
lama, to go
lanbuma, lanbilalama, to flow over (water)
lankurutnama, to be embarrassed
langama, langerama, langarilama, to mix
laragulara lama, to meet
larbiuma, to grind on a stone
larerama, laralama, to swim (as men)
larabalanama, to swim (as birds)
laralabuma, to swim (as fishes)
lakakia, a close relation
lada, a branch, a point
lalta, liqueous earth
lalkira, a stick put through the nose
lalkinta, the germ
lanba, under the arm
lankalaria, knowledge
lankeia, a monster, a hideous man
latjia, jams
lamaknirilinja, debt
larabilara, rushes
lara, a creek, the Milky Way
laralilama, to wash away
lauma, to hide away
ladna, many
lalkna, ready, in order
lakina, so, this way, like this
lakinja, so many
lanjalanja, precious
laragulara, again
lata, to-day, soon
latinja, new
lauala, alike, all the same
leltja, an enemy
lelterama, the waning of the moon
lelgerama, to slide, to conquer
lebmerama, to refuse, to retract
lerama, to desire, to long for
lelgeranama, to crackle
lebmintjerama, to leave behind (property of one deceased)
lelama, to promise
lenkuelama, to adorn
lenkunjalilama, to adorn himself
lelingintama, to admonish
lena, this
lenkina, you, thou
lelba, stiff
lelka, smooth, even
lelta, half (moon)
lenkutja, lenkunja, pretty, handsome
leoa, downward
lgurbma, foam
lgurbilama, to foam
lima, perhaps
linganginika, unruly
lira, none
lingiriuma, to press out
lingiuma, to plait
lilbalenkuelama, to give willingly
lilingerama, to boil
litna, the forehead
liorkna, a sucker on a tree
llanta, a vine of a creeper
llanterama, to creep (as vines)
lona, thick, broad
longa, far distant
longakalonga, far away from each other
loiloa, bad tasting
lola, the bottom
loatjira, a lizard
longura, the grass-tree
lora, grandmother
lodakama, to pick out
lolguma, to refuse, to reject
lowuma, to wipe out
lorilama, to water, to drink
loanilama, to stir
lolouma, to despise
louma, to wash
ltarbatuma, to clap with hands
ltarama, to crackle
ltalderama, to rot
ltirama, to wound
ltjumburknerama, to cease growing
ltarkalama, to rattle
ltarauma, to pinch, to twitch
ltirkna, healthy, bold, aloud
ltatjiltatja, one, alone
ltumba, able, skilful
ltirba, sorry, sad

ltalba, lulbalulba, lumanamana, } full
ltalda, rotten
ltjanma, cray-fish
ltulba, the instep
lturkna, a crack
ltumba, skill, ability
lturkarauma, to foretell, to predict
lurra, not thirsty
luara, against
lutula, short
lubata, unwilling, obstinate
lunkura, diverse, different
luaela, intentional
lunbatunbata, surly, sulky
luma, to untie, to loose
luralama, to swell
lunga, shade, a hut
lupara, the upper part of the leg
lurkna, the veins, sinews
lurinja, a stranger
lurbaka, winter
luaila, intention
lukultmunta, misty rain
lutjula, lukuna, } there
lulilakalama, to go downward
lupatilama, to keep, to retain
lularatama, to become thick
lunkurilama, to penetrate, to distinguish
lunerama, to catch, to seize
lurkutankama, to slander
lupaterama, to sulk
luarerama, to turn himself to one
lurkninama, to charm
lunbatunbaterama, to grumble, to become sulky
luailerama, to intend
lurkneritjilama, to stop

M

mama, a wound
mana, bread, vegetable food
manga, flies
mandera, clothes
maia, makura, } mother,
mangabara, the ghosts of enemies deceased
mainama, to hold or keep fast
makerama, to spare, to avoid
makaralalbuma, to return unsuccful
mamilama, to wound
mangalima, to drive away flies
mankama, to grow
mankatjintama, to grow up
mankalerama, to get entangled
mankilama, to finish
mantilama, to shut, to close
marerama, to become good
marilama, to make good
maijinga, good, moral
makalaria, not good to eat or drink
makalaria, dangerous
mala, female
manta, closed, blunt, deaf
manka, finished
manderagata, with clothes, *i.e.*, clothed
mara, good
matia matitja, } entangled
mata (part.), full
matera, { ornament for the neck, light clouds
mbailitunkara nama, to kneel down
mbakama, to pull out
mbakarinama, to unite
mbakanama, to lean against
mbakatninama, to snap
mbakalama, to burst open
mbalilama, to act badly, to sin
mbangaralama, to double
mbanama, { to bear a child, to breed, to lay eggs
mbankama, to groan with pain
mbangararterilama, to make two single ones to pair
mbarkama, to shine
mbarama, to make, to feel
mbakata, open, clear of timber, bare
mbala, you two
mbāla, very bad
mballa, warm
mbanka, tough
mbarkinja, bright, shining
mbanja, matrimony
mbantika, a plain
mbala, sin, wrong
mbangara, a pair
mbalaka, summer
mbanjambanja, a mouse
mbenka, a flood
mbenja, a place
mbitjera, an owl
mburkagatilalama, to make visible, to reveal
mbenbalalbuma, to go or pass over
mbeltjerinama, to compare
mbeltjilama, to throw together
mbomberama, to nurse (sick ones)
mbenka, large (fire or water)

mbogulba, short
mburkagatala, evident, open, visible
mbultja, innocent
mbobula, in the middle
mbola, the middle
mbobiputaputa, a multitude
mbultjama, diarrhœa
mbultjita, Capparis Mitchelli (tree)
mburka, the body
mitja, fire, firewood
molbamanalama, to wedge his way through
molbamainalilama, to wedge, press a thing through
monjamonijilama, to have pity
menta, sick, ill
monja, slowly
multitja, reeds
mulknura, worsted spun of hairs
murulunga, } Duboisia Hopwoodii
mononga, } ("pituri-" tree)

N

nama, grass
nanka, the chest
nankarakara, pain in the chest
nala, here
nalka, satisfied, no longer hungry
nangera, erect, straight
nana, this
natera, these two
nanankana, } these
nanirbera, }
nanta, an overloaded stomach
nakagata, so big
nalbatnauma, to invite, to press
naltanalterama, to meet, to see each other
naltauma, to throw on one heap
naltairima, } to see each other
naltanaltairima, }
namilama, } to alter, to change
namerama, }
namaneulama, to roll himself
nangeralalama, to soar (as birds)
nantalerama, to cease
nankalilama, to stamp with the feet
nangilindama, to turn oneself on the side during sleep
nanterama, to fill the belly
narguma, to press out
natalilama, } to dissuade one
natalatalilama, }
natama, to dislike
nurama, to rub out seeds
natata, a scorpion
nbanka, remained
nborba, slippery
nbunjala, back
nbata, a stalk of grass
ndolja, picture, likeness
ndolka, a fork, branch
ndolkarinama, to put across
ndardanama, to be silent
nealatnerama, to swear
nenterama, to understand
nenterama, to become distinct
nergama, to like, to be fond of
nentilama, to make known
nekua, father, thumb
nenta, strange, indistinct
nga, thou
ngalbanga, fresh, recovered, healthy
ngetjina, then, as, against
ngera, like, similar
ngualkna, with many branches, hairy, dense
nguanga, tame, peaceful
ngambakala, a domestic, a native
ngamara, the native pheasant
nganja, } a well
ngaroa, }
ngapa, a crow
ngira, a spot
nguanga, peace
ngumba, a hill
ngurangura, evening, afternoon
ngula, cool, pleasant, healthy
nguinba, to-morrow
nguinbarbuna, the day after to-morrow
nguna? who?
ngunatera? which two?
ngunirbera? which?
ngamiuma, to unfold
ngankalilama, to knock at the door
ngalbanga nama, } to move or stretch
ngalbanga lama, } oneself
nganelilama, to move, to turn anything
ngama, to carry
ngabitjauma, to turn, to roll something
ngakilkiuma, to contradict
ngetjima, to fetch, to bring
ngetjalbuma, to fetch or bring back
ngima, } to beget
ngirima, Dual, }
ngulerama, to become cool or pleasant
ngulilama, to make cool, pleasant, or healthy
ngurbmalilama, to think, to suppose
nilkna, secretly
nilknamba, a thief

ninkarauma, to keep secret for himself
nilknalinama, to steal
ningalauma, to suffer
nimbatnama, to appoint, to decide
nintakanintilama, to separate, to divide
ninkierama, to become contented
ninterama, to meet
ninkea, contented
ningalkua, afraid
nintangara, once, one time
ninta, one
nitia, } a young man or woman unmarried
nitaia, the menses
njaua, a crumb of bread, soft black clay
njora, a bush fire
njakerama, } to weep, to deplore
ntauerama, }
njerama, to fish
njalbutawama, to throw, to hit unintentionally or by chance
njarerguma, to make a knot
njarkuma, to forbid
njualilalama, to justify himself
njuma, to drink
njualelama, to justify
njualelanama, to overtake (running)
nkanja, the point, dinner-time
nkanjarinja, a widower
nkala, rain-clouds
nkanjunta, a shower of rain
nkarba, others
nkuabera, corroborree of women
nkarknerama, to astonish
nkaualama, to ask for leave
nkarpauma, to turn anything round
nkelalanama, to offer for exchange
nkererilama, to undermine (water)
nkolanama, to give only good things
nkulbinkurilama, to get quite contented
nkenkalalbuma, to read
nkeabuna, a gift, a present
nkirkna, an angry one
nkarkna, excited
nkanjabuna, unmarried, single
nkarakara, not there
nkurkuturkuta, altogether, all of us
noa, husband, wife
noaitilja, } a married couple
noakatana, }
nonba, first
nota, the lap
nuarintjama, to stink
nunangerama, to thunder
nurknanarerama, to become stinking, to spoil
nulanulilama, to dash to pieces
nuralibama, to stop
numberama, } to stay away
nuatnama, }
numbilkera, forbearing, patient
nunkara, } this side
nunkarakwa, }
nura, quiet
numbaka right
nururka, the heel
murbma, resin
ntalbintalba, with many branches
ntanga, green bushes
ntalta, the rays of sun
ntaiuma, } to whore
nilkalindalama, }
ntankerama, to become healthy, to recover
ntalterama, to become a man, manly
ntaringama, } to follow
ntama, }
ntanjalerama, to give only bad things
ntarbatarinama, to separate
ntarbatariralama, to separate himself
ntarauma, to swing
ntarbukama, to tear off, to split
ntanterama, to watch
ntankama, to call
ntainama, to spear
ntaterama, to become quiet again after mourning
ntaramatarauma, to advise
ntatnama, } to have a belly-ache
ntaterama, }
ntalama, to accompany
ntangerama, } to dip in
ntangalama, }
ntankalelama, to save, to redeem
ntanka, healthy
ntatna, strong, powerful
ntakagata ? how big ?
ntaritja, calm (wind), quiet (water)
ntaginga ? how many ?
ntana ? where ?
ntananga ? whence ?
ntauna ? whither ?
ntoritja, ranges, steep
ntotnima, } to refuse eating,
ntotninama, } satisfied already
ntema, to give
nteelama, to light a fire
nteliuma, to flash, to lightning
ntitjalbuma, to give back, to return

ntjalinama, to charm
ntjinama, to blow (wind)
ntjinanama, to go, to draw away (clouds)
ntjumalama, to go for good
ntjualilama, to follow
ntjilbutilama, to hit
ntjumala ntema, to give away, to make a present
ntjumara nama, to turn away from another one
ntjuma, to be in discord
ntjima, ntjilima, } to warm himself
ntjia, sweat
ntjabera, whole
ntjara, distinctly (speaking)
ntjuma, away
ntjelba, not sappy, dry
ntuaragala, farther away
nturkna, sad, sorry
ntuara, ntuarakwa, } other side
ntuarintjirka, through
ntualilama, to hit not, to miss
ntuana, yellow
nturantura, bad, ugly (face), angry
nturba, true
ntulta, steps on a ladder
ntulba, the hip
ntura, a split, crack
ntuma, to dance
ntutilama, to feed, to nourish
ntutjarauma, to announce
nturknerama, to become sorry
nturanturerama, to distort the face
nturbalilama, to confess
nturbankama, nturbilama, } to speak the truth
nturuma, to growl
ntutamea, food

O

ortja, ortjataka, } false, untrue
ortjalta, a lie, untruth
ortjerama, to lie
ortjerinarina, a liar
ortjibebilama, to deceive, to swindle
ortjitingerama, ortjitingilama, } to deceive, to disappoint
ortjitingilalama, to deceive oneself

P

parpa, quick
parpala, quickly
puta, hill, stone, mount
parama, to stop, to bar
palbaparama, to take away, to conquer, to subdue
putapalalama, to go incautiously or boldly
parempara, a bend of a creek

R

raba (suff.), without
raltutja, a clear distinct voice
ramalkura, all the same, alike
rambarknira, mad, furious, raging
raienkama, to breathe
railakaraila ntema, to give unequally
rakama, to take away
ralbarankama, to babble
ralibuma, to make heaps
rambarambatnanama, to wash away (water)
rangauma, to remit (punishment)
rantarkninkama, to sob, to hiccough
rauerilama, to separate himself
rauerama, to scatter
raualilama, to throw away, to sow
ratjilauma, to endeavour to do
rargua, the Pleiades (stars)
raga, the hand
rangiltja, accidental
ranjaranja, furious, wrathful, excited
raka, after
rarka, rirka, } bald, hairless
rata, short (speech)
rara, rukura, { easy, light
rarpa (suff.), self
renalama, to go thither
reknuma, to call
rerama, rilerama, } to get angry
relbukama, to pull away
rera, kangaroo
renta, about
reta, first, dumb
rilama, to let, to take care, to look about
rinjerama, to wish, to desire
rinjanama, to like
rinjerguma, to strangle
rinjulbmerama, to choke, to die by thirst
rinjalatnama, to send one away
riljinga, the twilight in the morning
rinja, the throat
rilera, tame, quiet, good
rilerarilera, harsh-, rough-voiced
rirtja, dry
rirtna, soft

rinjintjirka, thirsty
riralama, to walk quickly
rirama, to shine
rirtjerama, to get dry
ririralbuntama, to run away
rolta, very angry
roamba, temperate, sober
roka, quiet
rorgama, rorginjama, } to make a noise
rokerama, to get quiet
rokilama, to make quiet
roralilama, to shake
rotna, the chin
rukutilama, to offer, to promise
rubulubulerama, to get dizzy
runtalkniuma, to shut, to forgive
rumerama, to appear
rumeritjalbuma, to appear again
rualima, to run (as water)
runkula, wise, accustomed
rula, wood
rurra, a room
rutjarutja, a large wooden tray

T

ta, tautara, I
taiinta, even, smooth
tamba, loose, shaking, perishable, fading
taltja, unripe, green, weak
talkina, fugitive
talambata, long (speech)
tana, there
tanja, long, tall
tarta, shallow, not deep
taringaringa, laughing, merry
taia, the moon
tagitja, a block of wood, the ribs
takera, the roots of plants and trees
talkua, a line, a sign
talua, the end
tantalinalina, a curtain
tangatanga, the cross bone
tailbelilama, to stumble
takalilama, to push on, to drive on
takalama, to tumble down through age
takerama, to be frightened sometimes
takiuma, to sow
takurindama, to lean against
talama, to shut out (water)
talakauma, to hear attentively
taluerama, taluilama, } to finish, to cease
talakerguma, to span, to tie round
taljilama, to reconciliate
taljawuma, to throw far away
tama, to crack with a whip
tambarkalama, to creep, to crawl
tanbilama, to offer for exchange
tangaparama, toaparama, } to encircle, to shut
tantama, to prick, to sew
tangutangilama, to change, mistake or relieve
tangitjatalama, tortopagama, } to shut in, surround or encircle
tangilama, to come before one
tangitjalama, to help, to assist
taraunjinama, to blow up or make up a fire
taratnama, to hang down
tarama, to laugh
tapinba, alive
taritjerama, to get calm (wind)
tatama, to glow
tataka, red, evening-red
tata, a spark
taua, a bag
taturatura, hell
teuma, to scrape, or scratch off
teelintama, to make afraid
teelabuljabula nama, to honour
terirama, to become afraid
terilkalama, telaelalama, } to flee, to run away
tekua, a rat
terilka, fright, fear
teelabuljabula, honour
terabalabalalama, to warn
telama, to show
tenama, to beget
tera, two
tentia, topata, } slanting
terba, pretty
tilirkilirka, all of us, at once
tinjauma, to inter, to bury
tmaiatuma, to ask, to consult
tmanjiratjalama, to haunt (ghosts)
tmatera, to get perplexed
tmapalalama, to swim
tjaba, worms, maggots
tjaia, a path
tjalbma, chips
tjalabalapa, the navel
tjalanka, resin
tjaka, the joint of bones
tjamalarelja, an honest one (trustworthy)
tjarita, a furrow, a deep track
tjata, a spear
tjata, a species of Hakea
tjatjera, companionship

tjauarilja, the part of game given to the old men
tjakama, to kill, to throw fatally
tjanalilama, to lead or guide through
tjankala, at last
tjaka, loose, shaking
tjarunka, knowing, wise
tjarbinarinama, to make a heap
tjartjatuma, to correct, rectify or to confess
tjartjarinama, to pay a visit
tjartjagatilama, to agree with, to affirm
tjarinama, to draw, pull off, or pull
tjeba, a piece
tjebma, the ribs
tjekula, tjukukula, } Cycas-palms (Encephalartos MacDonnelli)
tjelia, a small wooden tray
tjebakama, to break in pieces
tjenjama, to appoint
tjenkama, to appear (the souls of the deceased)
tjerama, to roast
tjeberama, to get broken
tjerentama, to exchange
tjikai (interj.), ah ! see !
tjibatjiba, zealous, industrious
tjikara, full of cracks
tjinba, familiar, intimate
tjiltja, soft, tender
tjimara, a row or line
tjimaralama, to go in one line
tjiberama, to look under or down
tjinbalama, to wait for one
tjinbalilama, to make intimate
tjinankilama, to reconciliate
tjinatnama, to twist together
tjina, tjilera, } a friend, a mate
tjilera, white worsted
tjininga, property
tjintalbintaninja, full of abscesses
tjoa, meagre, poor, (also) boys
tjoerama, to get poor or meagre
tjontilama, to begin
tjontia, the beginning
tjora, the shin-bone
tjora, sunshine
tjoananga, twins
tjaiairima, to look out for the road
tjortjikama, to console, to comfort
tjubmara, } the nail of fingers and toes, the claws of birds
tjumala, for ever as a present
tjunama, to lift, to lift up
tjurirama, to look at
tjurknanterama, to get strong again, to recover
tjuerama, to heal
tjurankama, to rush or roar (as water)
tjurka, figs
tjulka, limestone
tjununkara, a sacrifice
tjurungara, corroboree
tjuta, porcupine grass
tmata, false
tmaina, perplexed
tmara, a camp
tmariltja, a native, a domestic
tmarankanja, the camp of the men
tmarankinja, an abandoned camp
tmaratmara, beetles
tmaranja, a question
tmanjinga, tmora, } a stalk of grass
tmalabortja, the hip
tmulbura, the throat
tmura, dense, broad
tmurka, yesterday
tmurkarbuna, the day before yesterday
tnakuna, dirty
tnāgama, to part to divide
tnakama, to believe
tnama, to stand, stand up or get up
tnadangauma, to lift upon, to lift up
tnakalama, to rise in wrath
tnaritjerama, to be glad, to get merry
tnainama, to graze, to pasture, to watch
tnanbuma, to jump over, to jump
tnabuta nama, to be unchaste
tnabuta, rank, unchaste
tnatna, pitiful
tnara, the hind-part
tnainaninanina, a shepherd
tnalta, a path
tnadinga, stem of a tree
tnadinga, the lower part of anything
tnama, a pointed stick
tnanjama, to praise
tnanbutnanbulama, to jump (as a kangaroo)
tnauma, to drive away
tnauerama, to be discontented
tnakinjiuma, to part, to give each his part
tnaljama, to crush, to smash
tnanakatatuma, } to knock to pieces, to crush seeds
tnatangauma, to help or assist

tnerka, peaceable
tnerkarkerama, to dissuade
tnerenkama, to blame
tnenema, to hit fatally
tnetuanetnana, rheumatism
tnenka, a revenger
tnitimbuma, to be angry
tnitatalama, to curvet from joy or pain
tnitaumalanama, to counteract
tnilalama, to weep, to weep for
tnima, to weep
tninjarirama, to separate himself
tniritjerama, to hope
tnita, the belly
tnitjimba, voluntary
tnitemba, half full
tnoatnoa, rich
tnonta, pregnant with child
tnolba, intemperate
tnolkama, to get a fright
tnolkalilama, to cry for fright
tnoerama, tnoeranjama, } to lift the hand in beating
tnoirama, to aim at, to take aim
tnunmerama, to get faint by heat
tnumbarilama, to groan with pain
tnurinjilama, to foretell or predict
tnunta, a corner
tnuma, a cripple
tnuntintnunta, cornered, angular
topinba, alive
topinga, behind
toparinama, to put upon
topintjarinama, to skin, to cut off
torintama, to press on
topanama, tuakama, } to bend down, to stoop
tonkama, to draw (water)
toperama, toperanjama, } to turn round
topalealerama, to turn himself round
topangatopangilama, to fence
tolkinjalama, to walk about for nothing
toperanjalbuma, to come back
toparilama, to boast
tora, the land near creeks
topa, the back
topirka, the kidneys
topangatopa, a fence
tuedaguteda, far away from each other
tuatjatuatja, lazy, idle, slow
tutna, certain, true
tunka, short, thick
tuorala, the place of the ghost of enemies
tuatja, } the claw, the steps cut in the bark of trees in order to climb up them
tuma, to beat
turuma, to frighten
turinjilama, to make short
tuedinama, to change, to take a wrong one
tunama, to order, to command
tuailalama, to pay a visit
tungarilama, to announce, to threaten
tuelagama, to break the neck
turatura, short, low
tupa or tuatja, a valley or gorge
tukara, tmataka, } an ulcer or abscess
tuta, also, too, and

U

ulaialama, to disperse, to scatter
ulbara, the ears of cereals
ulbainja, a boomerang
ulbulbara, a sow-thistle
ulba, colour
ulbulbana, bats
ulbaia, creeks
ulbatja, ringneck parrot
ulbmara, a dust-storm
ulbarara nama, to hang up
ulburkninjatuma, to beat time (at a corroboree)
ulbma, narrow
ulbutia, exhausted
ulbuta, dirty, old, perished, bad
ulbutilama, to make bad or dirty, to damage
ulbuterama, to become bad or old
ulbelama, to dash in small pieces
ulbunjama, to pull off or out
uboljilama, to wither, to fade
uboljerama, fading, withering
ulerama, to hide away
ulelama, to increase
ultarbakabirka, coloured, gay-coloured
ultagulta, under water
ulta, hollow
ultargama, to break, to tear
ulta, the side, the front part
ultamba, honey
ultmunta, dust
ultunta, drops
ultmelama, to bring or drive together
ultuma, to cover
ultundikima, to drop
umba, to blister, to gall

umbulara, the rainbow
una (prep.), in, on, to, into
unbuma, to send away or off
unbulama, to revoke, to leave
unkulunkulilama, to damage, to injure
unkualtjerama, } to crumble, to
unkualtjilama, } moulder
unbantjainama, to smell bad, to stink
unba, stinking
unda, a clay-pan
unkuana, bones
unbulata, bitter, bad tasting
unka or enta, almost
unta, thou, you
unkwanga, thy, your
unbata, serious, earnest
unma, ripe, cooked, roasted, well-done
unkuanka, bloodthirsty
unkuala, sweet
unkulara, a valley
unbulara, a little whirl-wind
unkualtja, crumbs, small pieces
untama, to endeavour, to strive for
ura, fire, firewood
uranburanba, fiery, like fire
urubaruba, a big whirl-wind
urbia, a messenger
urara, an echo
urbula, black, dark, blue
urbutja, some
urbutjarbuna, some others
urunka, wise, learned, accustomed
urungara, also, too
urbanama, to sprinkle
urgarbuma, to prepare
urgultalawama, to flash, to lightning
urbmultjalama, } to tumble down through age, to crush
urerinama, to go through between others
urenama, to disappear
ururinjaruralama, to go to and fro
uruntjama, to kiss
urunkuntema, to teach
urunkerama, to learn, to get accustomed
urknuerama, to rot
urkwarkerama, to destroy by fire
urumba, elder sister
urumbinjara, brothers and sisters
urkna, sap, a liquid
urana, a murderer
uruna, the James' Ranges
urbura, small magpie
urba, the backbone
urbina, seed-pods, a scar or mark
urumitja, wilderness, desert
uritjima, Mount Sonder
utnuma, to bite

W

wa,
wabala,
wakuia, } yes, of course, certainly
wantai,
wataka, } certain
walbawalba, overheated
wara, only, without purpose
wantinja, sappy
watawara, slender, thin
wantama, to affirm
wabalilama, to assent, to consent
walama, to think, to suppose
wagama, to keep, to detain
wankama, to swell
wangerama, to grumble, to murmur
wanama, to blow (wind)
wanjalama, to lick
waritja, a hut
warka, a crumb of bread
wama, to throw
warentama, to borrow, to give for a time only
waratalama, to go in a line
watinjalama, to spot, to stain
watinjalilama, to stain himself
welgalilama, to bend
wedawedalama, to spy
wolanitjalbuma, to go to the assembly
wolatja, breasts of females
wola, a heap, a meeting or assembly
wolibuma, } to heap, to pile, to as-
wolilama, } semble
wolakama, to bark (as dogs)
wolakawalerama, to remember
wonjama, to suck out, to suck
wontama, to provide for
wonawonilama, to keep, to detain, to preserve
wotilberama, to prick up the ears (horses or dogs)
worinterama, to get strong again (after illness)
wolkna, a grave
wora, a boy
wóra, steam
wotna, wet, moist
woka, why
worinta, solid wood
wota, again, once more, more
wumbuma, to burn

wunierama, to perish by thirst
wunia, mosquitoes
wunja, wunjinga, } aunt
wumbia, warmth, heat
wurinja, wind

———o———

ADDENDA — terminations of time

nguntangunta, morning before sunrise
ngutnala, morning after sunrise
nkanjankanja, before noon
nkanja, noon
ngurangura, afternoon
alkneraka, evening
namaltalbutia, after sunset
lilika, now, directly
lata, now, to-day, soon
latakwaia, only for a little while
tmurka, yesterday
tmurkawaia, the day before yesterday
tumurkalkura, some days ago
imankatmurka, some time ago
imankakata, long time ago
imankaltjiranga mballa, from eternity
inguntawaia, the day after tomorrow
inguntalkura, in some days
ingunta anma, in a short time
ingunta arbarmaninja, in a long time
ingunta arbarbuka, in an uncertain time
etatjata, in eternity
rinba, long time ago
irolangala, a very long time
lata ngala, a short time
lata ntema, soon again

———o———

NAMES OF SNAKES INDIGENOUS IN CENTRAL AUSTRALIA.

Non-venemous. — Renina (carpet snake), knaringa, rata, inturkuna, latna, runburunga, ntadirka,

Venemous.—Putamanina, ilumbalitnima, lalagalba, kelupa, kabaltaringa, ilbiralea, lalbalanana, elanjararantanina, erulangalanana, ntjurtja, baraloatjira.

Contributions on the Fungal Flora of Australia.

By Professor Dr. F. Ludwig, of Greiz, Germany.

[Translated and communicated by J. G. O. Tepper, F.L.S.]

[Read December 2, 1890.]

I.—The Parasitic Fungi, classed as "Rusts" and "Smuts" (Uredineæ and Ustilagineæ).

The Rusts and Smuts belong to those moulds, which, on the one side, may be studied by the general public, but have special interest for the owner of a microscope on account of their diversity of forms; on the other side they enforce general recognition by infesting many flowering plants, notably those cultivated by farmers, gardeners, foresters, &c., which are sometimes not only seriously damaged by them, but wholly destroyed. The more complete knowledge of these moulds has led people in Europe to avoid much damage and loss in various instances. Thus the ordinary Corn Rust *(Puccinia graminis)* is decreasing since the Berberis-hedges are being removed from the neighbourhood of cornfields (upon these the Æcidium-generation is developed); plantations of conifers and fruit-trees remain both free from the attack of the rusts since they are being rigorously separated, because the *Gymnosporangium* species of the Coniferæ require the fruit-trees to complete upon them their Rœstelia-stage, and *vice versa.*

Another corn rust, *Puccinia rubigo-vera*, is also widely distributed in South Australia; its Æcidia develope upon Boraginaceous plants. It is therefore only necessary to discover the particular species in order to limit and prevent the spreading of the rust.

In this direction there are numerous other practical problems connecting themselves with this question, *which can only be solved with any certainty when the fungal flora of the respective country is approximately known.* This, as shown by the following List of known Australian Rusts and Smuts, is by no means yet the case. In this direction even the ordinary practical worker can render valuable assistance, also those scientific students who are actively engaged in other specialties could turn advantageously some of their attention to the fungi. In the interest of the elucidation of the fungus flora of South Australia, and of the later practical deductions that might be drawn from the results

thus obtained, the members of the Royal Society are urgently requested to promote this work as much as lies in their power. If desired I will readily undertake with my mycological friends the identification of the collected material.

LIST OF AUSTRALIAN UREDINEÆ.

Of the Rust Fungi rather more than 1,200 species are known, and in a small district of Germany, containing a few square miles, several hundred species are to be found. From the whole of Australia only some thirty species, as enumerated here, are known.

For the sake of brevity, the three generations, Æcidium, Uredo, and Teleutospores, are indicated respectively by the Roman numerals I., II., III.

Uromyces vesiculosus, Wint.—On *Zygophyllum ammophilum*, II., III., Spencers' Gulf (Baron F. v. Mueller).

" **fusisporus**, Cke. et. Mass.—On *Acacia salicin* Melbourne (Baron F. v. Mueller), II., III.

" **digitatus**, Wint.—On *Acaia notabilis*, II., III., Gawler (J. G. O. Tepper).

" **Tepperianus**, Sacc.—On *Acacia salicina* and *A. myrtifolia*, III., Mount Lofty (Tepper).

" **Microtidis**, Cke.—On *Microtis porrifolia*, III., N. S. Wales.

" **Limosellæ**, Ludw.—On *Limosella aquatica*, I., III., Kangaroo Island (Tepper).

Puccinia graminis, Pers. (Corn Rust).—On *Avena sativa*, II., III., Melbourne (Reader), I. (Æcidium), not yet known from Australia, elsewhere on *Berberis* sp.

" **rubigo-vera**, D. C. (Red Rust), (I.), II., III. In Europe the Æcidium of this rust, which is very injurious to cereals (Rye and Barley), also developes upon Boragineæ (*Anchusa*, &c.); from Australia only II. and III. are known as yet, on *Poa annua* (Melbourne, Reader), *Alopecurus* (Coromby, Victoria, together with *Sclerospora macrospora*, Sacc.; Tepper), and wheat (all the colonies).

" **bullata** (Pers.), Schrœter.—On Umbelliferæ, I., II., III. In Europe also an enemy for cultivated plants, such as Celery, &c.

" **Prenanthidis** (Pers.), Fuchel.

" **rimosa** (Lk.), Wint.—On *Isolepis nodosa*, near Melbourne (Reader).

Puccinia Lagenophoræ, Cke., I., II., III.—On *Lagenophora Billardieri*, at Omeo. The same plant is also attacked by a mildew fungus, viz., *Erysiphe (Dimerosporium) Ludwigianum*, Sacc. The Mount Lofty Ranges (Tepper).

" **Saccardoi,** Ludw., I., III.—On *Goodenia geniculata* (Tepper). To it belongs, doubtlessly, *Æcidium Goodeniacearum*, Berk.; on *Selliera radicans* (Reader). On plants of this order was also found another fungus, *Synthytrium Succisæ* (Tepper).

" **aucta,** Berk. et. Muell., I., III.—On *Lobelia anceps*, *L. pedunculata*, and *L. platycalyx*, Victoria.

" **Ludwigii,** Tepper, II., III.—On *Rumex Brownii*, Coromby, Victoria (Tepper).

" **Malvacearum,** Mont., III.—On different Malvaceous species (Reader, Tepper). This rust came first from Chili to Europe, and has been distributed over all continents, and everywhere injured the wild and cultivated mallows greatly, even eradicating them at some places.

" **Alyxiæ,** Cke., III.—On *Alyxia buxifolia*, near Brighton, Victoria (Campbell).

" **Berkeleyana,** De Toni, III.—On *Dichondra repens*.

Phragmidium Barnardi, Plow. et. Wint. (I.), II., III.—On *Rubus parvifolium*; Victoria (Barnard), S. Australia (Tepper).

" **Potentillæ** (Pers.), Wint., (I.), II., III.—On *Acæna Sanguisorbæ*, near Melbourne (Reader). The species of this genus, of which a number is known from all the other continents, occur only on Rosaceæ.

Melampsora Lini, Pers. (Flax rust).—On *Linum marginale*, &c., near Melbourne (Reader), Murray River (Tepper).

Uredo Clematidis, Berk.—On *Clematis microphylla*; Melbourne (Reader).

" **notabilis,** Ludw.—On *Acacia notabilis*; Roseworthy (Tepper). The Uredo spores of this rust, which deforms the phyllodia considerably, have been described and figured by me in the "Bot. Centralblatt," No. 27, 1890 (the cellular contents of the peduncle should be removed from the figure), and are distinguished by a very remarkable surface sculpture. They are covered

by reticulations resembling the cells of bees, within which arise small rounded protuberances. The other stages of this and the other Uredo, Rœstelia, and Æcidium kinds have to be discovered yet.

Uredo armillata, Ludw.—On *Juncus pallidus*, near Coromby, Victoria (Tepper). It belongs to an unknown species of *Puccinia*.

" **angiosperma,** Thuem. — On *Hakea* (Baron F. v. Mueller).

" **Anguillariæ,** Cke.—On *Anguillaria dioica;* Upper Macquarie River (Hamilton).

" **Rhagodiæ,** Cke. et. Mass.—On *Rhagodia Billardieri* (Watt).

" **Spyridii,** Cke. et Mass.—On *Spyridium parvifolium* (Watt).

Rœstelia polita, Berk.—On *Muehlenbeckia Cunninghamii* and *Jacksonia scoparia*. Brisbane. Most probably belonging to some Gymnosporangium of some Cypress species.

Æcidium Cymbonoti, Thuem.—Victoria.

" **Ranunculacearum,** D.C.—The Crow's-foot Æcidia belong to various kinds of rusts affecting Gramineæ.

List of Australian Ustilagineæ.

Our knowledge of the Australian Smuts is not much better than that of the Rusts, for of about 400 known species of Ustilagineæ only the following 15 are known from Australia, some of which also are unwelcome guests to the agriculturist:—

Ustilago segetum (Bulliard), Wint. The common black smut of the cereals. On *Avena sativa*; Melbourne (Reader). On wheat, &c.

" **bromivora** (Tul.), Wint. On *Bromus mollis*; Melbourne (Reader).

" **solida,** Berk. On *Schœnus imberbis;* Melbourne (Reader).

" **utriculosa** (Nees), Winter. In the flowers of *Polygonum minus;* near Melbourne (Reader).

" **australis,** Cke. In the carpels of *Eriachne*, sp. (F. v. M.).

" **Muelleriana,** Thuem. In the seeds of *Juncus planifolius*; Victoria (Baron F. v. Mueller); Mount Lofty (Tepper).

Ustilago Fimbristylis, Berk. In the seeds of *Fimbristylis*; Melbourne.

" **marmorata,** Berk. On the leaves of *Isolepis prolifera.*

" **Tepperi,** Ludw. In the stem and floral parts of *Amphipogon strictus* and *Neurachne alopecuroides*; Torrens Gorge and Highbury Scrub (Tepper).

Cintrastia axicola, Berk. In the grains and panicles of *Cyperus, Scirpus,* and *Fimbristylis.*

Doassantia punctiformis, Wint. On *Lythrum hyssopifolium*

Thecaphora globulifera, Berk. et Br. In the palea of *Leersia hexandra.*

Sorosporium Muellerianum. In the panicles of *Cladium filum.*

" **Eriachnis,** Thuem. In the spikes of *Eriachne.*

Cerebella Paspali, Cke. et Mass. On *Paspalus scrobiculatus.*

II. Parasitic Enemies of Eucalyptus and Acacias.

Among the fungi collected by Mr. Tepper during the last few years the parasitic enemies of Eucalypts and Acacias are remarkably numerous. They have been partly identified by me, partly by Messrs. Winter and Saccardo at my request. They are the following:—

A. *Enemies of Eucalypts.*

Polyporus Eucalyptorum, Fr.

Hexagona durissima, Berk. On *E. obliqua.*

Poria mollusca, Fr. On *E. obliqua.*

" **obliqua,** Fr.

Polystictus cinnamomeus, Jacq.

Ceriomyces incomptus, Sacc., *n. sp.* Conidia-form of a *Polyporus.*

Crepidotus haustellaris, Fr. On *E. viminalis.*

Panus lateritius, Sacc.

Stereum fasciatum, Schr.

" **cyathiforme,** var. *minor,* Sacc.

Xylopodium australe, Berk. On *E. hemiphloia;* Victoria.

Rhamphoria tenella, Sacc., *n. sp.* On *E. viminalis.*

Comarosporium Eucalypti, Wint.

Physarum album, Fr.

B. *Enemies of Acacia.*

Phyllosticta phyllodiorum, Sacc., *n. sp.*
Septoria phyllodiorum, Sacc., *n. sp.*
Uromyces digitatus, Wint.
" **(Pileolaria) Tepperianus,** Sacc.
Uredo notabilis, Ludw., *n. sp.*
Capnodium elongatum, Berk. et Cke.
Stereum hirsutum (W.), Fr.
" **Kalchbrenneri,** Sacc.

III. On the Position of Clathrus (Ileodictyon) Tepperianus, *Ludw.*

Since I published the description of a species differing from all forms of *Clathrus* hitherto known under the above name (Bot. Centralblatt, Nov. 27, 1890), a larger work of one of the best authorities in respect of the Phalloideæ has appeared ("Untersuchungen zur vergleichenden Entwichlungsgeschichte und Systematik der Phalloideen," von Dr. E. Fischer, in Denkschriften d. Schw. Naturf. Gesellsch., vol. 32, part 1., 1890). In this work the distinguished mycologist reduces several hitherto separate kinds into wider species. This he does also with the hitherto distinct species of *Clathrus (Ileodictyon) cibarius* (Tul.), Fischer, (with transversely ridged branches), and *Clathrus gracilis* (Berk.), Schlecht (branches delicate and smooth). With the union of these two species the independence of *C. Tepperianus* would also cease, as the latter stands between the two former. It resembles *C. cibarius* in the dimensions and the breadth of the reticulating branches, and approaches the *C. gracilis* type by their smoothness, but does not nearly reach the dimensions of some species in the London and Paris collections. From the standpoint of Dr. Fischer the three hitherto recognised species, *C. cibarius*, *C. Tepperianus*, and *C. gracilis*, would have to be united under the name *C. cibarius* (Tul.), Ed. Fischer. Herr Fischer, however, writes to me :—"To be quite sure in the union of these species, all the connecting links of the series should certainly be before me, at least in the form of spirit specimens, and even then it would not be certain whether these different forms were individual variations or constant varieties. Only observations in the respective localities or artificial cultivation can decide this point."

To initiate and encourage such observations and cultural experiments *in loco* has been the motive for the above remarks.

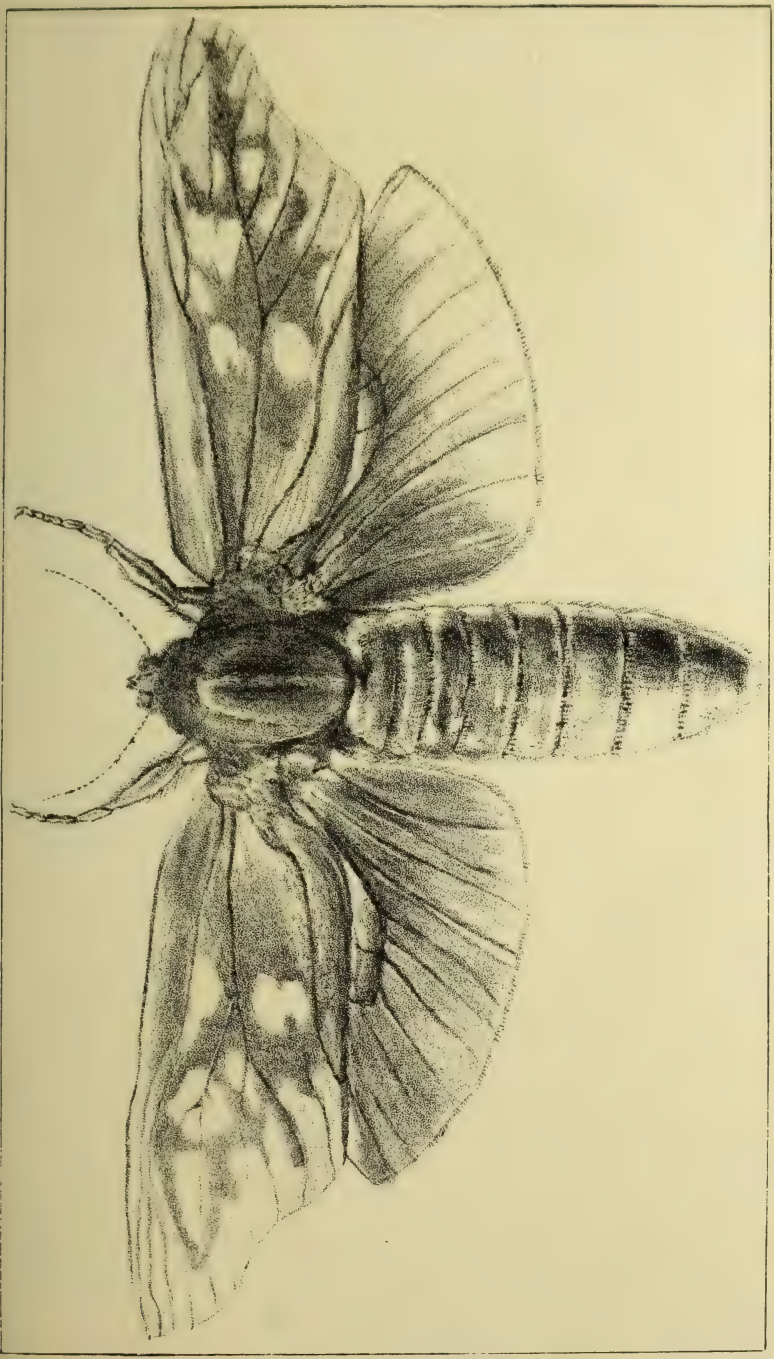
Remarks on Photographing the Solar Eclipse of 12th December, 1890.

By D. B. Adamson.

[Read February 3, 1891]

I lay before you to-night some photo-negatives of the late solar eclipse, also a photographic enlargement of one of the same. The instrument used in taking them being a Newtonian reflector of $12\frac{1}{2}$ in. aperture. Although with this instrument (when armed with the solar diagonal and dark glass) we can gaze on the sun's disc very comfortably, I found that a further reduction of the light would be required for the purpose of photography. Knowing that eclipses do not wait for any one, I set about making preparations and experiments a week before hand. My first attempt was with a diminished aperture and a very short exposure (one which might almost be termed instantaneous), using a common dry plate. On developing this I was somewhat surprised to find that on the centre of the plate (where a black disc should have been) there was only a circle of clear glass more transparent than the surrounding parts of the plate, the gelatine having quite disappeared from the exposed part. My next idea was to remove the silver from the face of the small speculum (having spare ones), and to place behind this a piece of black woollen cloth, in hopes of reducing, if not altogether getting rid of, the double reflection. I found that this gave a very cool reflection, but still so distinctly double that it was of no use for my purpose, so I replaced the small silvered speculum. I next removed the silver from the large speculum (having a duplicate of same), leaving only the bare glass to give the reflection, and by reducing the aperture of the telescope to seven inches, I succeeded in producing the photos as you see them. Although the slowest dry plates were used, and the exposure was almost instantaneous (being the time occupied by a one and three-quarter inch hole in a slide falling past a similar hole at the focus of the telescope), still it was too long, but by using a very weak developer the photos came out fairly sharp. My plan of procedure was in the first place to watch for the first contact, which took place at 11 h. 21 m. 3 s. a.m. This was very sharp and clear, the atmosphere being fairly steady. I next gave my attention to photographing, taking five negatives at various stages of the eclipse, my desire being to obtain one as nearly central as possible. This,

I thought, would be a permanent and measurable record of the quantity of the eclipse for future reference. Having obtained the negatives, the next thing was to watch for the final contact. Not only was the sun's image less steady at this period, but also an alarm of fire somewhat disturbed the observation, so that it was not so certain as the first, still I do not think it can be more than two seconds out. The final contact took place at 1 h. 54 m. 30 s. p.m. By these times of first and final contact I find that the second photo I took at 12 h. 36 m. 4 s. was 1 m. 42·5 s. earlier than the centre of the eclipse, but the nearest thereto. From this I have made a photographic enlargement, six and a-half inches in diameter. By applying the accompanying scale of hundredths to this photo, we see at once that the encroachment or overlapping measures 40·5 hundredths. Allowing for the photo not being exactly central, a very small amount should, of course, be added. Being so near the centre of the eclipse, the advance made would be very small (not more than half one of the divisions of the scale), so that the whole amount of the obscuration may fairly be set down as 41 hundredths of the sun's diameter. As proof of this, it may be added that the third negative, taken at 12 h. 40 m. (being 2 m. 13·5 s. later than the centre of the eclipse), measures just perceptably less than the former. It may be stated as a proof of the absence of anything in the way of distortion that the photos taken previous to the eclipse are perfectly circular. The enlargement is so sharp that on close examination some of the protuberances on the moon's limb can be readily distinguished.



COSSUS EDWARDSI.—*Tepper.*

Description of a New Species of Cossus.

By J. G. O. Tepper, F.L.S.

[Read February 3, 1891.]

Plate I.

Cossus Edwardsi, spec. nov. Female. Dark blackish grey. Palpi prominent, reflexed, underside white, upper black. Eyes grey, with irregular black patches. Antennæ setaceous, narrowly white above, remainder dark greyish brown; basal joint very stout, as long as five or six of the next put together, the two following about half the diameter of the first, rapidly tapering; remainder very short, and very gradually tapering to a fine point at apex. Face blackish, a patch of scales above the palpi, and the hair-like scales around the base of antennæ whitish. Prothorax dark blackish grey; in front a patch of long black scales, intermixed with a few white ones. Mesothorax broadly bordered in front, and laterally by long white hairs, blackish behind. Metathorax blackish, broadly white laterally, narrowly behind. Abdomen dark blackish grey, with some very narrow paler bands above, a broad pale stripe laterally, white when adjoining the dark brown, pale bordered, very glossy ventral plates, the last two segments covered with dense white down underneath. Wings blackish, margins and border grey, the latter with very devious inner boundary on the forewings. Forewings between subcostal and median vein, with three roundish spots, rather large, the middle one largest, and separated into two very unequal parts by a dark cuneiform line; a large round white spot in the middle of the disk below the median vein; a small whitish spot between the apical branches of the latter. Hindwings, the costa, and the space overlapped by the forewings white, remainder dark brownish grey. Veins dark brown, much more curved than in *C. cinereus*. Fringe very narrow, pale. Underside of thorax and legs covered with dense whitish down, the forewings clouded lighter and darker, most of the markings of the upper side visible below; subcostal and median veins bordered broadly by long bluish-white hairs for about two-thirds of the length; space beyond anal vein silvery white; hindwings have the costa partly and narrowly white, remainder ashy grey. Length of body, $2\frac{3}{4}$ inches; span of wings, $6\frac{1}{3}$ inch.

The species differs from the common *Cossus cinereus* in much

darker colour, the characteristic and promiscuously spotted fore-wings, and the different curvatures of the veins.

A single specimen was received through Mr. G. E. Edwards, from Windsor, near Adelaide, on December 5, 1888, no other having been seen previously by me or other collectors, to whom I have shown it. Mr. Hy. Edwards, a noted Lepidopterologist of the United States America, who visited Adelaide last year, has studied this and its allied family specially, and has lately written me that he cannot find anything at all resembling this species among described ones. It is hereby dedicated to him and the finder conjointly.

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

[Read April 7, 1891.]

IX.

CARABIDÆ.

HYPHARPAX.

H. Sloanei, sp. nov. Minus elongatus; viridi-æneus; antennis (his apicem versus vix infuscatis), palpis, mandibulis (his basi apiceque piceis), pedibus (femoribus leviter infuscatis), elytrorum margine tenui, et abdominis apice, testaceis; prothorace fortiter transverso, postice quam antice vix latiori, postice utrinque foveolato, foveolis vix perspicue punctulatis, lateribus modice rotundatis, angulis posticis obtusis vix rotundatis, latitudine majori vix ante medium posita; elytris fortiter striatis, interstitiis subconvexis postice haud magis elevatis, 3° prope apicem puncto setifero instructo.

Maris tarsis anterioribus 4 fortiter dilatatis, intermediorum articulo 1° subtus simplici; femoribus posticis subtus late angulatis (vix dentatis); tibiis posticis leviter arcuatis. Long, 3 l.; lat. $1\frac{1}{10}$ l.

From the other species of *Hypharpax*, not greatly larger than it, the present species may be known by the combination of the following characters:—Legs entirely pallid (the femora only a little brownish), elytra strongly striated (almost as strongly as in *H. ranula*, Cast.); anterior 4 tarsi of male very strongly dilated (about as strongly as in *H. inornatus*, Germ.); posterior femora of male only widely and obtusely angulated in place of the strong tooth found in *H. inornatus*, *vilis*, &c.; posterior tibiæ of male regularly and only slightly curved, not bent inwards strongly near the apex. Perhaps the strong striation of the elytra is the best single character. The prothorax is almost as in *H. inornatus*, Germ., as also are the hind tarsi.

N.S. Wales; taken near Mulwala by Mr. T. G. Sloane.

DICROCHILE.

D. ventralis, sp. nov. Sat elongata; minus convexa; sat nitida (mas) vel subopaca (femina); nigra vix æneseens; antennis palpis tarsisque plus minus picescentibus; prothorace quam

longiori vix tertia parte latiori, quam caput vix latiori, canaliculato, obscure transversim rugato, lateribus minus late reflexis ante medium subangulatis ante angulos posticos sinuatis, his obtusis sat distinctis ; elytris striatis, interstitiis sat planis (nihilominus 3° 5° 7° que apicem versus carinatis, 3° mox ante apicem externe abrupte angulatim dilatato), 3° punctis 2 vel 3 instructo.

Maris segmentis ventralibus 3-5 in medio sat crasse transversim rugatis vel squamoso-punctulatis et setis pallidis obsitis. Long., 7 l. ; lat., 3 l.

The sides of the prothorax very distinctly sinuate behind (and angular before) the middle, together with the peculiar sculpture of the elytral interstices posteriorly, render this a very distinct species. The prothorax is scarcely more than half as wide as the elytra. The peculiar external angulation of the hind part of the third elytral interstice is best observed by looking along the elytra with the head of the insect directed towards the observer when it is very conspicuous. Compared with *D. Goryi*, Boisd. (apart from colour and the very different shape and proportions of the prothorax), this species has the prothorax obscurely roughened with fine puncturation (where in *Goryi* it is strongly rugulose), much less widely margined, &c. ; the elytral interstices much less convex and very differently formed at the apex ; also the ventral segments of the male much less nitid and having all the middle part sculptured and setiferous (in *Goryi* there is an irregular line of setiferous rugulosities on either side of the middle line). Of other previously described species *gigas*, Cast., *punctipennis*, Cast., and *quadricollis*, Cast., are *inter alia* much larger, *punctato-striata*, Cast., has elytral striæ strongly punctured, *montana*, Cast., has the prothorax "short and transverse," *minuta*, Cast., is much smaller than the present species, and *brevicollis*, Chaud., has the prothorax even more transverse than *D. Goryi*.

S.A. ; near Port Lincoln.

HYDROPHILIDÆ.

PARACYMUS.

P. nigerrimus, sp. nov. Breviter ovalis ; convexus ; nitidus ; niger, nullo modo metallescens ; antennis (clava excepta) prothoracis lateribus pedibus elytrorumque apice rufescentibus ; corpore supra sublævi-elytris sub lente forti vix perspicue punctulatis. Long., $1\frac{1}{5}$ l. ; lat., $\frac{3}{5}$ l.

The complete absence of sculpture—except the sutural stria of the elytra which is obsolete in front—will distinguish this species from all its known allies. Unfortunately, I have not been able

to spare a specimen for dissection, without which it is impossible to be sure of all the structural characters, but I think there is no doubt of its being closely allied to *Paracymus (Paranacaena) Lindi*, Blackb., and *sublineatus*, Blackb., of which it has quite the facies, and the structural characters so far as I have been able to examine them.

Mountains of Victoria.

LACCOBIUS.

The following species may, I think, be attributed to this genus (not previously recorded as Australian so far as I know), although they differ from the European members of it in having maxillary palpi somewhat more robust, the labrum shorter, the mesosternum tuberculated (not sharply carinated) in front of the middle coxæ, and the tibiæ set with short stiff erect bristles. In general appearance, sculpture, &c., they resemble the European *L. minutus*, Linn., but are a little more elongate in form. The distinctive characters mentioned above might justify a new generic name, but I am satisfied that for the present it is better to minimise genera, and so should be disposed to attribute to *Laccobius* all species belonging to *Hydrobiides* (Lacordaire), and having eight-jointed antennæ, tibiæ devoid of swimming-hairs, prothorax and ventral segments of the *Hydrobius*-type, and facies style of sculpture, &c., resembling the European *Laccobii*. *Hydatotrephis* differs *inter alia* in having the last joint of the maxillary palpi not longer than the penultimate, but in some characters comes near *Laccobius*.

L. montanus, sp. nov. Sat late ovalis; sat nitidus; brunneo-piceus; antennis (clava excepta), palpis (apice summo excepto), clypeo, prothorace, pedibusque dilutioribus vel testaceis; supra crebre æqualiter sat aspere punctulatus; elytris leviter striatis; prothorace fortiter transverso, antice fortiter emarginato, lateribus sub-diaphanis, angulis omnibus rotundatis. Long., $1\frac{3}{4}$ l.; lat., $\frac{4}{5}$ l.

The texture of the lateral portions of the prothorax is so thin that these parts are transparent; the prothorax is very much wider across the base than in front (though the hind angles are so entirely rounded off that there is no clear distinction between the sides and the base; the sides and apex of the elytra are paler in colour than the disc. Compared with the European *L. minutus*, Linn., this species is throughout much more closely and evenly punctured, the puncturation being moreover scarcely so strong as that on the prothorax of *L. minutus*.

Victorian mountains.

L. australis, sp. nov. Præcedenti affinis; differt statura minore, prothorace in medio infuscato, hoc et capite multo sparsius

nec aspere punctulatis, elytris magis perspicue striatis, striis quam interstitia magis fortiter punctulatis. Long., $1\frac{2}{5}$ l.; lat., $\frac{7}{10}$ l.

I have no doubt this is a good species, although very close to the preceding. In *L. montanus* the puncturation of the whole upper surface is very equal and quite asperate, being so evenly distributed on the elytra as to include the punctures of the striæ, and make these latter quite confused with those of the interstices. In the present species the puncturation of the head and prothorax (especially the latter) is much finer and less close than that of the elytra, while on the elytra the puncturation of the striæ is quite noticeably distinct from that of the general surface.

Victoria; Ovens River.

CERCYON.

C. flavipes, Fab. I have recently taken this species (at any rate, I cannot find any character to justify regarding it as distinct) at an elevation of about 5,000 feet above the sea, on the Victorian Mountains.

PAUSSIDÆ.

PAUSSUS.

P. australis. Sat angustus; sat opacus; obscure rugulose (præsertim in elytris) punctulatus; ferrugineo-rufus; elytris fascia lata nigra ornatis; antennarum articulo 1° elongato-piriformi, 2° quam 1^{us} duplo longiori et duplo latiori difforme (ad basin truncato, ad apicem rotundato, supra in parte basali concavo in parte apicali fortiter convexo); prothorace in medio valde strangulato, parte antica fortiter transversa postice bifida, parte postica minus fortiter transversa supra profunde late longitudinaliter sulcata. Long., 2 l.; lat., $\frac{7}{10}$ l.

The dark fascia on the elytra is at its widest near the lateral margin which it does not quite reach; thence it narrows a little towards the suture, where its width is nearly half the length of the whole suture, its hind extremity being distant from the apex about a fifth of the length of the whole suture. This species is interesting as being the first genuine *Paussus* recorded from Australia.

Queensland; Mt. Bartle Frere; presented to me by C. French, Esq.

STAPHYLINIDÆ.

TACHINUS.

T. noritius, sp. nov. Sat nitidus; ferrugineus; antennis (apicem versus) elytris (parte postica præsertim) meso- et meta-sternis abdomineque infuscatis; elytris prothorace fere duplo longioribus; capite prothoraceque lævibus; elytris sparsim sat subtiliter, abdomine crebre minus subtiliter, punctulatis. Long., $2\frac{1}{5}$ l.; lat., $\frac{4}{5}$ l.

In the male the anterior tarsi are rather strongly dilated, on the upper surface the apical segment of the hind body ends in four sharp teeth, and on the under surface the penultimate segment of the hind body is sinuous or feebly emarginate in the middle and the apical segment is very deeply incised (the middle of the incision being convex hindward), both these segments having a conspicuous pencil of long ciliæ on either side.

I hesitate a little as to whether this species should be referred to *Tachinus* or *Tachinoderus*. The principal distinctions between the two (I know *Tachinoderus* only by description) appears to be that the latter has the mesosternum carinate and the hind body margined only at the base, while the mesosternum of the former is simple and the entire hind body strongly margined. In the present insect the mesosternum is not quite so evenly rounded as in the European *Tachini*, but certainly cannot be called carinate, and the hind body has an entire margin, but it is very much narrower than in the European *Tachini*. The mouth organs seem to agree in all respects with those of *Tachinus*; these, however, are described as being similar in *Tachinoderus* also.

In order to compare this species with some well-known one, I place it beside a specimen of the European *T. marginellus*, Fab. (which Mr. Olliffe reports from Sydney; probably introduced), and find that besides the structural distinctions mentioned above, it differs in its elytra being somewhat longer in proportion, its prothorax and head almost lævigate (under a high power some sparse very fine puncturation can be detected), its elytra with puncturation much more sparse and feebly impressed with a longitudinal depression on either side of the suture, making the latter appear carinate, and with the apex evidently more rounded, and the puncturation of its hind body decidedly stronger with a more or less longitudinal arrangement giving the appearance somewhat of longitudinal wrinkles.

Mountains of Victoria; a single example imbedded in snow.

HETEROTHOPS.

H. taurus, Blackb. I find that I was in error in referring this species to *Heterothops*. An examination of its prothoracic stigmata has satisfied me that it is a *Quedius*, and should stand near *Q. hybridus*, Er. The short acutely-pointed apical joint of the maxillary palpi misled me, but now, knowing the species to be a *Quedius*, I can see that even those organs are not really inconsistent. From *Q. hybridus* it may be distinguished *inter alia* by its antennæ entirely red.

QUEDIUS.

Q. cuprinus, Fauv. (var.? *Baldiensis*). Sat dense subtiliter fulvo-pubescens; piceus; antennis basi et apice, ore, pedi-

busque testaceis: elytris subœneis, basi suturaque obscure testaceis; abdomine subirideo, apice cupreo-testaceo; an tennis sat robustis, articulis nullis transversis; capite elongato angusto subparallelo, oculis parvis vix convexis; prothorace quam longiori vix latiori, antice fortiter angustato, angulis posticis cum basi omnino rotundatis, puncturis usitatis notatis; scutello elytrisque (his prothorace vix longioribus) leviter squamose sat crebre, abdomine sparsim crassius, punctulatis. Long., $2\frac{1}{5}$ l.; lat., $\frac{3}{5}$ l. (vix).

In M. Fauvel's tabulation of the Australian *Quedii* (Ann. Mus. Gen., 1877, p. 268) the present species would fall under "B" (along with *Q. æneus* and *cuprinus*) on account of the narrow elongate form of its head. It is much smaller than either of those species, and *inter alia* differs also from the former of them by the sparse puncturation of its hind body, and from the latter by the testaceous apical joints of its antennæ and the rounded-off hind angles of its prothorax. It is to be noted that the apical joint of the maxillary palpi in this species is slender, very acute at the apex, and much longer than the penultimate joint. In spite of these differences, however, it seems to me not improbable that this is a small Alpine var. of *Q. cuprinus*, and I have given expression to this opinion by recording it as above.

Mountains of Victoria; a single example in moss at an elevation of about 5,000 feet above the sea.

HYPEROMMA.

During a recent visit to the Victorian Alps I was fortunate in securing two examples (male and female), which evidently belong to this remarkable genus (previously known only, I believe, by a unique male example from King George's Sound), and which M. Fauvel describes as sharing with only two other genera of *Staphylinidæ* the singular character of having the eyes placed on the upper surface of the head. I cannot doubt that these two examples are identical specifically, although the differences (all sexual, I believe) are considerable, and I am not absolutely certain that they were taken in company. The species seems to be extremely close to the typical one (*H. lacertinum*, Fvl.), but the sexual characters of the male forbid its being regarded as identical unless on the supposition that M. Fauvel was mistaken as to the sex of the specimen he described. This, however, appears to me sufficiently probable to render it inexpedient to give a distinctive name to the species before me, and I shall therefore offer the following as probably merely a correction of the sexual characters assigned to M. Fauvel's species. I cannot find any tangible specific character in which the insects before me do not satisfactorily agree with the very full and clearly-expressed description

of *H. lacertinum*, although the *colour* is not quite identical. M. Fauvel says (Ann. Mus. Gen., 1878, p. 68), "obscure rubrum, abdomine picco." In one of my examples the head is nearly black, while the prothorax and elytra are reddish; in the other the head and elytra are red, while the prothorax is nearly black; but I do not attach any importance to these differences.

H. lacertinum, Fauv.? Mas. Capite latiori; tarsis anticis *L* fortiter dilatatis; segmento ventrali apicali profunde triangulariter anguste inciso, penultimo in medio profunde subrotundatim foveato; supra segmentis 2-4 in medio longitudinaliter leviter canaliculato, segmento apicali postice sat angustato.

Femina. Capite minus lato; tarsis anticis vix dilatatis; segmento ventrali apicali postice sat angustato fere ut maris inciso, penultimo simplici; supra segmentis haud canaliculatis, segmento apicali postice sat lato.

LATHROBIUM.

L. Victoriense, sp. nov. Depressum; sat robustum; sat nitidum; parce pilosum; piceo-rufum; abdomine (apice excepto) obscuriori, antennis palpis elytris pedibusque testaceis; capite a basi antrorsum angustato, quam prothorax haud latiori, sat fortiter sat sparsim (postice et latera versus magis crebre) punctulato; prothorace quam latiori parum longiori, postice haud angustato, utrinque sat fortiter minus crebre punctulato, angulis omnibus sat rotundatis, lateribus subconcavis; elytris prothorace sat latioribus, tertia parte longioribus, leviter obscure punctulato-striatis; abdomine crebre subtilissime (apicem versus minus crebre) punctulato; antennis elongatis. Long., $2\frac{3}{5}$ l.; lat., $\frac{1}{2}$ l.

This species is no doubt near *L. gratellum*, Fvl., described on a unique male from Sydney. Even if the insect before me should prove to be the female of that species, it is sufficiently remarkable in colour to be regarded as an Alpine form deserving a name; it is not likely, however, that such is the case, for, apart from colour, it differs in the head being narrower as compared with the prothorax, and triangular rather than quadrate; in the prothorax not being narrowed hindward (except, of course, close to the base, where the sides round off into the base), and I should judge in the stronger puncturation of the prothorax, which in *gratellum* seems to be finer than that of the head; whereas in the example before me the puncturation of the head and prothorax seems to be very similar in character. I hardly know where to place the present species in M. Fauvel's tabulation of the Australian *Lathrobia* (Ann. Mus. Gen., 1877 and 1878), as its tarsal structure would associate it with the group called "I.," while all

the species with the head at its widest close to the base fall in the group called "II."

Mountains of Victoria.

PÆDERUS.

P. Meyricki, spec. nov. Apterus; nullo modo parallelus; niger; prothorace rufo, elytris cyaneis; oculis parvis; elytris basin versus angustatis, prothorace haud longioribus; abdomine retrorsum sat dilatato; cætera fere ut *P. cruenticollis*, Germ. Long., $3\frac{4}{5}$ l.; lat., $\frac{4}{5}$ l.

The insect is at its widest across the hind body. The smallness of the eyes will at once separate it from the various forms of *P. cruenticollis*; the difference of size may be stated thus—in *cruenticollis* the hindmost point of the eye is about equidistant between the front of the same and the point where the lateral margin (or base) of the head is in contact with the neck, while in the present species the hindmost point of the eye is very distinctly nearer to the same than to the neck. I am a little doubtful whether this may not be the apterous insect which M. Fauvel (Ann. Mus. Gen., 1878, p. 516) mentions as a var. of *cruenticollis*, but if so I think that learned entomologist must have overlooked the difference in the size of the eye.

W. Australia; taken in 1886 by Mr. Meyrick.

P. cruenticollis, Germ. In November last year I found this species in countless thousands crawling over the snow on some of the highest peaks of the Australian Alps.

LITHOCHARIS.

L. varicornis, sp. nov. Sat robusta; parallela; pilis erectis sparsim vestita; minus nitida; picea, elytrorum sutura rufescenti, antennarum basi et apice prothorace abdominis apice pedibusque rufis; crebre subtilissime punctulata; elytris prothorace vix longioribus. Long., $1\frac{4}{5}$ l.; lat., $\frac{3}{10}$ l.

Not unlike the European *L. brunnea*, Er., in build, but with very much finer and closer puncturation and somewhat longer elytra; the head is shorter than in that species, being a little shorter than the prothorax. Joints 3—7 of the antennæ are nearly black. The short series before me appears to be of one sex only—female.

Victorian Alps; among dead leaves.

SCOPÆUS.

S. ruficollis, Fvl. This is really an undescribed species, as its author merely points out in what respects it differs from the European *S. Erichsoni*, Kolen. I have a *Scopæus* from the Alpine district of Victoria which may be it, or may not—the latter is more probable, since Queensland is said to be the habitat

of *S. ruficollis*; but it is impossible to be certain on the point. The description, however, is so deplorably useless that I think something will be gained by this Victorian form being described, even at the risk of its proving, sooner or later, to be identical with the Queensland one; I am unable to specify any very precise difference between the two forms, except that the specimen before me is a little smaller than *S. ruficollis* is stated to be, and that the elytra do not seem to be "shorter than those of *S. Erichsoni*," which (according to Dr. Kraatz) are "not quite a third longer than the prothorax." I do not possess a type of *S. Erichsoni*, the habitat of which is thus stated by Dr. Kraatz, "(Occurs) rarely in Central and Southern Germany." Some named forms occurring in France and Italy are recorded by Dr. Kraatz as varieties of *Erichsoni*.

S. dubius, sp. nov. Subnitidus; minus depressus; pube subtilissima vestitus; piceus, antennis prothorace abdominis apice elytrisque obscure rufis (his apicem versus dilutioribus), pedibus testaceis; alutaceus, vix manifeste punctulatus; capite quadrato, prothorace latiori; hoc oblongo, basi manifeste biimpresso, supra linea mediana obsoleta sat nitida instructo; elytris prothorace latioribus, tertia parte longioribus. Long., $1\frac{3}{5}$ l.; lat., $\frac{3}{10}$ l.

That part of the head which would be cut off behind a straight line passing across the front of the eyes is as nearly as possible an exact square—though with the angles of the said square rounded. None of the joints of the antennæ are transverse.

Besides *S. ruficollis*, Fvl., *S. digitalis*, Fvl. and *latebricola*, Blackb. have been described from Australia; of these the former has blackish or piceous tibiæ, and the latter is a smaller and less nitid insect with a longer head, &c.

S. obscuripennis, sp. nov. Minus nitidus; minus depressus; pube sat subtili vestitus; piceus, antennis palpis prothorace abdominis apice elytrorum apice pedibusque plus minus rufis vel rufescentibus; crebre subtilissime fere asperatim punctulatus; capite sat quadrato, quam prothorax parum latiori; hoc oblongo, basi subfortiter biimpresso, inter impressiones fere carinato, linea mediana elevata haud lævi vix manifeste notato; elytris prothorace parum latioribus, hoc nullo modo longioribus. Long., $1\frac{3}{5}$ l.; lat., $\frac{3}{10}$ l. (vix).

Very distinct from the preceding, on account of its much shorter elytra and decidedly more defined puncturation; the antennæ and tarsi, moreover, seem to be a little stouter, and the general appearance is duller and more obscure. The colours vary a little, the lighter parts in some examples being more decidedly red than in other examples; in some the elytra are of a nearly

uniform dark-brown tint, while in others they have a wider and rather conspicuous dark-red hind border; the distinctness of the red margin of the elytra usually seems to vary according to the light in which the specimen is held. The legs are of a pale-brown colour (very different from the decided testaceous tone of the same in *S. dubius*), the femora sometimes more or less infuscate. In the male the third ventral segment is a little flattened in the middle of its hinder part, the fourth bears a semicircular fovea, the fifth is widely and shallowly concave in its whole length, and the sixth is widely and sinuately emarginate behind.

The present species would seem to differ from *S. ruficollis*, Fvl., in having shorter elytra, and probably in various other characters. From *S. digitalis*, Fvl., it appears to differ *inter alia* by its tibiæ being of uniformly light colour. *S. latebricola*, Blackb., is a smaller and narrower insect* with longer elytra.

Victoria; near Wandiligong, among dead leaves.

DOMENE.

I am perhaps running some risk in referring the following species to this genus, as I have not seen M. Fauvel's diagnosis of its characters,—but from its place in that learned author's tabulation of the Australian *Pæderid* genera and from references to *Domene* in other memoirs, as well as from the close resemblance of this insect to *D. Australiæ* as described by M. Fauvel, I think I am not far wrong; at any rate there is no other genus known as Australian to which the present species can be referred. Having only a single specimen, I have been unable to examine its mouth organs fully; but the following are its principal characters (some of which may be sexual) as far as they can be seen without dissection:—antennæ short, stout, of the *Lathrobium* type; head and prothorax almost as in *Scopæus*; anterior femora armed with a distinct (though not strongly developed) tooth beneath; front tibiæ with their upper portion compressed and dilated beneath into a large obtuse tooth, the lower portion slender; anterior tarsi not dilated; posterior rather short, the basal two joints equal or nearly so, the third a little shorter, the fifth shorter than the preceding four together.

The shape of the front tibiæ is very peculiar, and I should hesitate much (on account of this character not being mentioned in M. Fauvel's tabulation) to refer the specimen before me to *Domene* were it not for a note in Dr. Sharp's memoirs on New Zealand

* The measurement of this species, as of others described in the same memoir (Trans. Roy. Soc., S.A., 1887) was unfortunately taken with a millimetre measure which I afterwards discovered to be slightly inaccurate, or rather not in accordance with the theory of a millimetre equalling half a line. The length of *S. latebricola* is 1⅓ l.

Coleoptera, in which he distinguishes a genus of *Paederidæ* from *Domene inter alia* by its front tibiæ being "almost simple."

The genus *Domene* is characterised in M. Fauvel's Fn. Gall.-Rhén., vol. iii., p. 305,—a work to which I do not know how to procure access.

D. (?) Torrensensis, sp. nov. Tota pallide ferruginea; pedibus paullo dilutioribus; capite prothoraceque confertim subtilissime (illo subaspere), elytris vix minus confertim minus subtiliter, abdomine fere ut caput, punctulatis; prothorace linea mediana longitudinali tenui notato, hac postice sat manifeste elevata antice subobsoleta; elytris prothorace paullo longioribus. Long., $2\frac{2}{5}$ l.; lat., $\frac{2}{5}$ l. (vix).

The head and prothorax bear a system of very faintly impressed and very inconspicuous punctures larger than and additional to the system of very fine close puncturation mentioned above. The antennæ (set back) would reach quite to (but scarcely beyond) the base of the prothorax. The head and elytra are of about equal width, the prothorax being narrower.

This species seems to differ from *D. Australiæ*, Fvl., *inter alia* in being smaller with the elytra longer (in *D. Australiæ* these are said to be scarcely so long as the prothorax,—in the present insect they are distinctly longer). M. Fauvel's description of his species unfortunately consists largely of comparison with a European *Domene* to which I cannot refer, but should judge that its head is less closely punctulate than that of *D. Torrensensis*, as he says that it is "much more sparsely punctured" than that of *D. stilicina*, whereas the head in the present species is punctured about as closely as it well could be.

South Australia; in debris of the Torrens River.

PALAMINUS.

I met with a single example last November (in the Victorian Alpine district) of this genus represented in the Australian described fauna by a single species (*P. Australiæ*, Fvl.) described on a unique specimen from Queensland. As M. Fauvel's description (so-called) is merely a brief comparison with a species from New Guinea which probably is not in any Australian Museum, it is impossible to say whether or not the insect before me is identical; I should judge, however, that it is very similar, but it appears to be a little smaller, and is probably distinct. One feels strongly tempted to treat such worthless descriptions as non-existent.

BLEDIUS.

B. insignicornis, sp. nov. Minus nitidus; antice pube fulva minus crebre vestitus, abdomine setis erectis instructo; niger; mandibulis (his elongatis) antennarum que basi plus

minus rufescentibus, pedibus (tibiis nonnullis exemplis apicem versus infuscatis) et elytrorum macula magna laterali, testaceis; capite prothoraceque (hoc sat transverso, medio canaliculato, leviter minus crebre punctulato) alutaceis; elytris prothorace sat longioribus, sat fortiter sat crebre punctulatis; abdomine subnitido subalutaceo, segmentis singulis apicem versus punctulatis.

Maris mandibulis supra in medio dente suberecto armatis; tuberculis antennariis valde productis; antennis corporis dimidio longioribus.

Feminæ mandibulis inermibus; tuberculis antennariis parvis; antennis brevioribus. Long., $1\frac{4}{5}$ l.; lat., $\frac{2}{5}$ l.

The antennal tubercles of the male are produced into elongate subcylindric processes, while in the same sex the basal joint of the antennæ is extraordinarily developed (being as long as the prothorax), and the antennæ set back would reach almost to the apex of the elytra. The general facies is entirely that of a typical *Bledius*. The large conspicuous testaceous spot on the elytra near the lateral margin is a very distinctive character.

Victoria; on the banks of the Ovens R.

B. Ovensensis, sp. nov. Sat nitidus (capite prothoraceque subopacis); pube argentea vestitus, abdomine setis erectis instructo; niger, mandibulis tibiis tarsisque rufescentibus; capite prothoraceque (hoc minus transverso, lateribus pone medium sinuatim convergentibus) creberrime subtilissime punctulatis; elytris prothorace multo longioribus, crebre sat fortiter punctulatis; abdomine supra vix perspicue (subtus sparsius sat fortiter) punctulato; antennis brevibus.

Maris (?) prothorace haud canaliculato.

Feminæ (?) prothorace longitudinaliter subtiliter canaliculato. Long., $1\frac{1}{2}$ l.; lat., $\frac{3}{10}$ l.

This species must be near *B. aterrimus*, Fvl., but seems to differ by its differently coloured legs and much longer elytra; these latter are described as scarcely longer than the prothorax in *B. aterrimus*, whereas in the present species they are not much shorter than the head and prothorax together.

Victoria; on the banks of the Ovens R.

B. infans, sp. nov. Totus nitidus; pube argentea vestitus, abdomine setis erectis instructo; niger; mandibulis pedibus et nonnullis exemplis antennarum apice rufo-testaceis; capite prothoraceque (hoc minus transverso, lateribus pone medium sinuatim convergentibus, linea dorsali vix impressa) sublævigatis; elytris prothorace multo longioribus, crebre sat fortiter punctulatis; abdomine supra vix perspicue (subtus sparsim sat fortiter) punctulato; antennis brevibus. Long., 1 l. (vix).

Singularly like the preceding in miniature; differing from it chiefly by its differently coloured legs and nitid sublævigate head and prothorax. It is to be noted, however, that in some examples the femora are more or less infuscate.

Victoria; on the banks of the Ovens R.

PSELAPHIDÆ.

CTENISTES.

C. Andersoni, sp. nov. Rufo-castaneus, elytris postice piceis; antennis minus brevibus; prothorace leviter tranverso lateribus evidenter calloso, impressione basali intermedia antice subfurcata; elytris prothorace dimidio longioribus. Long., 1 l.; lat., $\frac{2}{5}$ l.

The antennæ are elongate, reaching back beyond the middle of the elytra; joints 1 and 2 short, slightly thicker than the following ones; 3-10 very slightly increasing in thickness. Of these, 3 and 7 are longer than the others and equal to each other, 8 is the shortest and is wider than long, 9 is scarcely longer than 8, 4 is scarcely longer than 9, 5 about equal to 4, 6 a little shorter than 7, 10 scarcely shorter than 7 [7 is quite twice as long as 8]; the eleventh joint is as long as the preceding three together, and is moderately dilated on one side from the base to beyond the middle, and then narrows again to the apex.

This species is evidently near *C. impressus*, Shp. (the largest Australian *ctenistes* previously described),* but is considerably larger. The antennal joints are very differently proportioned, but not in such fashion as to suggest difference of sex; and the antennæ are considerably longer I should judge (they certainly could not well be called "rather short," as those of *impressus* are). The expression, "elytra distinctly longer than the thorax," applied to *C. impressus*, moreover, suggests shorter elytra than those of *C. Andersoni*, especially in view of *C. simplex*, Shp., being said to have elytra half again as long as its prothorax, and to be distinguished from *C. impressus* by its proportionally shorter prothorax.

S. Australia; taken by my friend, Mr. J. Anderson.

BRYAXIS.

B. Lindensis, sp. nov. Nitida; setis erectis sat crebre vestita; vix perspicue punctulata; piceo-nigra; pedibus piceis (tibiis antice et tarsis omnibus pallidioribus), antennarum articulis

* *C. impressus* is stated by its author to be smaller than *C. vernalis*, King, but this seems to be a mistake, as the size given is 1½ mm. = $\frac{1}{16}$ inch, whereas *C. vernalis*, King, is given as $\frac{3}{50}$ inch. The mistake no doubt arises from Archdeacon King having in his original description of *C. vernalis* set down the size as $\frac{2}{25}$ inch, and afterwards (Tr. Ent. Soc., N.S.W., I., p. 102) stated that this was a mistake.

1-4 11que rufo-testaceis ; capite elongato, inter antennas impresso, postice utrinque fovea magna instructo ; prothorace brevi vix subcordato, basi utrinque foveolato, foveis linea transversa conjunctis ; elytris prothorace dimidio longioribus, stria suturali profunda altera discoidali (hac apicem versus abbreviata) instructis. Long., $1\frac{1}{5}$ l. (vix); lat., $\frac{3}{5}$ l.

The antennæ are stout and rather short (scarcely longer than the head and prothorax together); joint 1 is scarcely so long as 2 and 3 together, 3 is much more slender than the rest, 5 and 6 are stouter (5 scarcely larger than 6), 5-10 all transverse and not much different *inter se*, but all a little triangularly dilated on the inner side (so that the antennæ seem subserrate), 11 subconic and nearly as long as the preceding two together, but not stouter.

I am doubtful of the sex of the example before me, as I find no noticeable character in the ventral segments, while the antennal structure seems rather of the male type.

I do not think any previously described Australian *Bryaxis* of large size is of a nearly uniform black colour.

S. Australia ; in seaweed near Port Lincoln.

B. Harti, sp. nov. Nitida ; minus angusta ; breviter pubescens ; subtiliter minus crebre punctulata ; ferruginea ; antennis apicem versus infuscatis ; his minus elongatis, apice gradatim sat fortiter dilatatis ; capite inter antennas impresso, inter oculos foveis 2 magnis profundis instructo ; prothorace sat transverso, sat crebre punctulato, trans basin 3-foveolato (fovea media vix perspicua), foveis linea sulciformi conjunctis ; elytris prothorace plus dimidio longioribus, antice minus angustato, striis suturali et discoidali fortiter impressis ; abdominis segmento 1° 2° paullo longiori, simplici. Long., 1 l. (vix); lat., $\frac{2}{5}$ l.

Maris segmentis ventralibus in medio impressis, ultimo foveam subrotundatam (penultimo processum tuberculiformem) ferenti ; tibiis intermediis intus fortiter emarginatis, super et infra partem emarginatam dentes acutos singulos ferentibus ; tibiis anticis intus spina minuta sat longe ante apicem armatis ; antennarum articulo 9° 10° vix minore.

Feminæ segmentis ventralibus tibiisque simplicibus ; antennarum articulo 9° 10° multo minore.

The central basal fovea of the prothorax (as in *B. Ovensensis)* is scarcely more than a slight dilatation of the transverse furrow. The antennæ are as long as the head and prothorax together ; joints 1 and 2 are stouter than the following joints ; 1 a good deal longer than 2, 3 a little longer than 2 ; 4-7 scarcely so long as 3, and differing little *inter se* except in 5 being a little the

stoutest; 8 shorter but not less stout (it is distinctly transverse); 9 and 10 about equally wide, but 10 a little longer (9 transverse, 10 scarcely so) in the male [in the female 9 is about intermediate in size between 8 and 10, and 5 is not at all dilated]; 11 somewhat oval, as long as 9 and 10 together, and in the middle wider than either.

This species does not seem very near to any other previously described. The discoidal stria of the elytra seems a little less strongly impressed in some specimens than others, but I think this is an accidental variation.

South Australia; I have taken it near Adelaide, and also find it among some Adelaide specimens taken by the late Mr. Hart. It occurs among vegetable debris on the banks of streams.

B. hyalina, Schaufuss. Last November I found a *Bryaxis* in the Alpine district of Victoria which agrees fairly well with the description of this species so far as it goes, but it is impossible to be sure, as the description is very defective—not mentioning the puncturation of any part, and only casually alluding to the existence of any sculpture on the basal dorsal segment of the hind body. If the insect in question be distinct from *B. hyalina*, I should judge that it is likely to be distinguished by the two oblique striæ which run hindward from the front of the basal dorsal segment of the hind body being more strongly divergent, and by the puncturation being different; this on the head, prothorax, and hind body is fine, somewhat sparse, and inconspicuous; while on the elytra it is much coarser and closer, more so than is usual in (at least the Australian species of) the genus. From *B. flavipes*, Schauf. (another allied species), the long basal segment of its hind body will distinguish the present insect, which seems to agree with *B. flavipes* in having the striæ of the basal dorsal segment strongly divergent hindward.

B. inusitata, sp. nov. Nitida; sat brevis; sparsim ochraceo-hirsuta; ferruginea; antennis minus robustis; capite sat brevi, antice transversim 3-foveolato, postice utrinque fovea majori instructo; prothorace transverso lævi, postice foveis 3 (transversim positis nec linea conjunctis) instructis; elytris prothorace vix longioribus, transversis, perspicue punctulatis, humeris subtuberculiformibus, stria suturali profunde impressa discoidali subtilissima; abdominis segmento 1° quam 2^{us} 3^{us} que conjuncti sublongiori, basi fortiter transversim sulcato, utrinque juxta sulcum stria longitudinali instructo. Long., $\frac{3}{5}$ l.; lat., $\frac{3}{10}$ l. (vix).

The antennæ are about equal in length to the head and prothorax together. The basal two joints are very similar *inter se*,

each being much stouter, but not much longer than joint 3; joints 3-8 scarcely differ in thickness, except that 5 is very slightly stouter than 4 and 6; 4, 6, 7, and 8 are about equal in length *inter se*, and are slightly shorter than 3 and 5, which also are about equal *inter se*; 9 is scarcely longer than 8, but is stouter; 10 is very little longer, but a good deal wider, being transverse; 11 is about the same length as the preceding two together, and is still stouter than 10.

This species appears to me to stand near *B. brevis*, Schauf., which M. Raffray has formed iuto a new genus or subgenus, under the name *Schaufussia*. Although it comes very near Herr Schaufuss' description of the species, it does not present the character in the palpi on which *Schaufussia* is founded, and it differs from Herr Schaufuss' description in having the prothorax lævigate. I think its small size, short elytra, prothorax with three unconnected basal foveæ and curiously sculptured basal segment of the hind body are characters that in combination will suffice for identification. I do not find any characters decidedly determining the sex of the two examples before me.

S. Australia; in moss near Port Lincoln.

B. Ovensensis, sp. nov. Nitida; angusta; sparsim hirsuta; ferruginea; capite abdomineque vix infuscatis; antennis elongatis sat gracilibus; capite elongato lævi, inter antennas inæquali inter oculos 3-foveolato, foveola intermedia parva; prothorace vix transverso vix cordato, trans basin 3-foveolato (fovea media minus perspicua), foveis linea forti sulciformi conjunctis; elytris prothorace dimidio longioribus sparsim obscure punctulatis, antice fortiter angustatis, striis suturali et discoidali profunde impressis, abdomine ut elytra obscure punctulato.

Maris abdominis segmentis ventralibus in medio planatis; tibiis posticis apice valde introrsum curvatis. Long., $1\frac{1}{5}$ l.; lat., $\frac{2}{5}$ l.

The antennæ are distinctly longer than the head and prothorax together, and none of the joints are transverse; joints 1 and 2 are a little stouter than the following ones (1 a little stouter than and nearly twice as long as 2), 3-7 a little longer than 2 and subequal *inter se*, 9 very like 2 and slightly larger than 8, 10 about as long as 3, but much wider (almost transverse), 11 fully as long as 9 and 10 together, and evidently wider than 10; joints 1-7 (except, perhaps, 2) are all much longer than wide.

This species is very near *B. strigicollis*, Westw., structurally, but its facies is very different (form narrower and more elongate, antennæ longer and more slender, &c.). It seems to be also near *B. hortensis*, King, *lunatica*, King, and *electrica*,

King. From the first and last of them its antennal structure furnishes a ready distinction. I should hesitate to separate it from *lunatica* were it not for the phrase, "thorace breviter obcordato," in the description of that insect, a phrase which could not be rightly applied to the present insect, the prothorax of which is scarcely, if at all, wider than long. In the figure of the magnified antenna of *B. lunatica*, moreover, the second joint is represented as longer than the third, which is not the case in *B. Ovensensis*.

Victoria; in a marsh near the banks of the Ovens River, among dead leaves.

B. paludis, sp. nov. Nitida; sat angusta; vix pubescens; vix perspicue punctulata; ferruginea, antennarum clava vix pallidiori; antennis minus elongatis, clava 2-articulata, hac valde dilatata et elongata; capite inter oculos minute bifoveolato; prothorace æquali minus transverso, quam caput paullo longiori; elytris quam prothorax fere duplo longioribus, striis suturali sat distincta discoidali nulla.

Maris segmento basali ventrali antice creberrime aspere punctulato, postice obscure tuberculato, segmento apicali fovea rotunda impresso; tibiis intermediis intus in medio obtuse dentatis, posticis apicem versus dilatatis arcuatis.

Femina latet. Long., $\frac{1}{2}$ l.

The antennæ are scarcely so long as the head and prothorax together; the club consists of two joints, and is not much shorter than all the preceding joints together, and is very strongly dilated. Joints 1 and 2 are very stout and cylindric, 1 a little longer and stouter than 2; joints 3-9 stout and scarcely increasing in thickness, 3 scarcely transverse, the following joints becoming more so; 10 is about three times as wide as 9, and is as long as the preceding 3 joints together; 11 is of about the same width, and nearly twice as long as 10.

S. Australia; in debris on some marshy ground near Adelaide.

EUPINES.

This name was proposed by Archdeacon King for what he considered a subgenus of *Bryaxis*. I am inclined to think it may be treated as a good genus. I have seen numerous species referable to it, and find that (besides the characters mentioned by its author) they agree in exhibiting a uniform type of sexual peculiarity in the sculpture of the meta-sternum and second (the first that is readily apparent) of the ventral segments of the hind-body. The following Australian species apparently attributable to *Eupines*, have already been described (most of them as *Bryaxis*), viz:—

æquata, King
affinis, Schauf.
ampliventris, Schauf.
aurora, Schauf.
capitata, King
clavatula, King
concolor, Shp.
exigua, King
diversicolor, Schauf.
geminata, King
globulifer, Schauf.
melanocephala, Schauf.
picta, Schauf.
polita, King
pumilio, Schauf.
spreta, Shp.
sobrina, Schauf.
sulcata, Shp.
transversa, King
Victoriæ, King
vitrea, Schauf.

The following are distinguished from the above species of *Eupines* (though Archdeacon King did not consider the distinction more than sectional) by having antennæ of only 10 joints :—

Elizabethæ, King
laticlava, Schauf.

I am doubtful whether the following are *Eupines* :—

atra, King
læviceps, Schauf.
talpa, Schauf.
plecta, Shp.

The species of *Eupines* have much resemblance *inter se* as regards their superficial characters, but, so far as I can judge, are very well characterised by the sexual peculiarities of the metasternum and ventral segments. Unfortunately these are recorded in the description of the following only :—

concolor, Shp.
sulcata, Shp.
spreta, Shp.

There are sexual characters also in the antennæ and tibiæ of at least some species, which are more or less exactly recorded in the descriptions of many of the above-named.

The following species in my collection seem to be clearly distinct from any previously described, although it is possible (as noted below) that the first may be an Alpine form of one of Herr Schaufuss' species.

E. sororcula, sp. nov. Mas. Fere lævis ; picea, prothorace vix rufescenti, elytris sanguineis apice infuscatis, antennis palpis pedibus segmentisque ventralibus apicalibus testaceis ; setis erectis parce vestita ; capite inter oculos bifoveolato, inter antennas vix biimpresso et transversim leviter elevato, antice declivi ; prothorace æquali, leviter transverso, vix subcordato ; elytris prothorace fere duplo longioribus, humeris callosis, striis suturalibus distinctis ; antennis capiti prothoracique conjunctis subæqualibus, tibiis posticis apicem versus leviter dilatatis et sinuatis ; abdominis segmento dorsali 1° oblique bistriato, segmento ventrali 2° a basi ad apicem subtiliter in medio carinato ; meta sterno postice fovea profunda minori instructo (hac in fundo longitudinaliter sulcata). Long., $\frac{1}{2}$ l.

Of the antennæ, joints 1 and 2 are stouter than any of the following 6, and are together scarcely so long as joints 3-5 together; 3 and 4 are equal *inter se*, each much shorter than 2; 5 is very evidently but not very much longer and stouter than 4; 5-8 are equal *inter se*, and each a little smaller than 4; 9 is short and transverse, about as wide as 1; 10 not much longer than, but nearly twice as wide as, 9; 11 a little wider than, and about twice as long as, 10; none of the joints 1-8 are transverse.

Femina. A mare differt antennis (præsertim articulis intermediis) obscurioribus, longioribus, articulis aliter proportionatis; metasterno postice minus fortiter impresso, abdomine simplici.

Of the antennæ of the female, joints 3 and 4 and 6-8 are a little more elongate; 5 is not much longer or stouter than 3; 9 and 10 are together about as long as 6-8, neither of them transverse, 10 longer and wider than 9; 11 is a little longer but scarcely wider than 10.

The superficial characters of this species seem to be near those of *Bryaxis vitrea*, Schauf., of which no sexual distinctions are recorded by its author; the difference in colour is considerable, so that this form is at least deserving of a varietal name, even if it should eventually turn out to be a form of *vitrea*.

Victorian Alps.

E. nauta, sp. nov. Mas. Fere lævis; picea, prothorace vix rufescenti, elytris lateritiis, pedibus et antennis (articulis penultimis exceptis) rufis vel rufo-testaceis; glabra; capite prothoraceque æqualibus; hoc sat transverso vix subcordato; elytris prothorace plus dimidio longioribus, humeris vix callosis, striis suturalibus distinctis; antennis quam caput prothoraxque conjuncti vix longioribus; femoribus anticis subtus obtuse dentatis, tibiis anticis intus dente lato sat acuto armatis, femoribus ceteris dilatatis (posticis subtus fere subdentatis); metasterno late profunde excavato, parte excavata in medio obsolete longitudinaliter carinata; abdominis segmento ventrali 2° opaco creberrime aspere punctulato, fossa lata (hac apice carina elevata transversa terminata) per totam longitudinem impresso. Long., $\frac{3}{5}$ l.

Of the antennæ, joints 1-3 decrease successively in thickness, 2 and 3 being almost equal to each other in length, 1 a little longer; joints 3-8 scarcely differ in thickness, except 5, which is scarcely thicker than the rest; 4, 6, and 7 are equal *inter se*, each a little shorter than 3 and 5, which are of equal length; 8 is a little shorter than 7; 9 is almost globular, a little longer and stouter than 8; 10 is a little longer than 9, and nearly twice as wide, being pretty strongly transverse; 11 is very little wider

than 10, but is about twice as long; 10 is the only really transverse joint.

Femina. A mare differt antennarum articulo penultimo minus transverso; metasterno multo minus fortiter impresso; femoribus, tibiis, abdomineque simplicibus.

A marked character in this species is the strong contrast in respect of colour between the last two antennal joints; the almost complete absence of setæ, and also of foveæ on the head (two foveæ seem barely indicated in one or two examples), is also distinctive. The exposed portion of the hind body is strongly declivous.

The sexual characters in the antennæ are exceptionally slight, those in the legs, metasternum, and second (the first being scarcely visible) ventral segment are far stronger than in any other *Eupines* known to me.

S. Australia; near Port Lincoln, under the bark of a tree surrounded by flood waters.

E. nautoides, sp. nov. Mas. Ab *E. nauta* vix differt nisi tibiis anticis intus haud dentatis, metasterno postice minus excavato, abdominis segmento 2° simplici, elytrorum sutura postice carinata, retrorsum spiniformi producta. Long., $\frac{3}{5}$ l.

This insect, of which I possess two examples, is a very puzzling one, and I know not whether to regard it as an abnormal form of *E. nauta*, or as a distinct species; but its differences (such as they are) are so strongly marked that there seems to be certainly good reason for its having a distinctive name. I cannot even feel sure whether it is a male or a female, its ventral character being suggestive of the latter sex, while its dentate femora point very strongly to the former. On the whole I incline to think it the male of a good species of which I have not seen the female; the strong spine into which its elytra are produced at the sutural apex will at once distinguish it from all its described congeners. In the examples before me the legs are of much darker colour than in any *E. nauta* that I have seen, but this is quite likely to be accidental.

S. Australia; near Port Lincoln.

E. spiniventris, sp. nov. Mas. Ab *E. nauta* differt antennis sublongioribus; femoribus simplicibus; tibiis anticis posticisque (haud dentatis) paullo ante apicem intus emarginatis; metasterno multo magis late magis profunde excavato; abdominis segmento ventrali 2° sat nitido haud longitudinaliter impresso, postice tuberculum subconicum antrorsum directum, apice acutum formanti.

Femina latet.

My example of this insect is certainly a male, and though very close to *E. nauta* its sexual characters are quite inconsistent with the idea of specific identity. The emargination on the inner side of the front tibiæ is quite noticeable, but occupies only a small part of the tibia; that of the hind tibia is much larger, nearly the apical third part of the inner margin being very slightly concave. The hind tibia is at its widest just above the emargination, so that the dilatation at that point is capable of being regarded as a feeble tooth. The metasternum is largely, deeply, and almost circularly excavated; the corresponding excavation in *E. nauta* appearing as a wide longitudinal impression. The tubercle on the second ventral segment is of peculiar shape, and difficult to characterise intelligibly; the hind margin of the segment seems to be gradually elevated from either side towards the middle (where it is quite spiniform), and also bent forward; so that if the insect be viewed from the side, an inclined plane ending in a sharp point seems to run upward and forward from the apex of the second segment towards the metasternum.

South Australia; near Port Lincoln.

E. militaris, sp. nov. Mas. Fere lævis, sparsim obscure punctulata; glabra; picea elytris pedibusque manifeste, antennis vix manifeste, rufescentibus; capite haud (vel vix manifeste) bifoveolato; prothorace æquali sat transverso leviter cordato; elytris prothorace dimidio longioribus, humeris callosis, striis suturalibus sat fortiter impressis; antennis capiti prothoracique conjunctis longitudine æqualibus, fortiter clavatis; femoribus basin versus pedunculatis, intermediis subtus dente parvo armatis; tibiis intermediis ante apicem extus leviter emarginatis; metasterno late profunde excavato; abdominis segmento ventrali 2° in medio impresso et utrinque obscure tuberculato. Long., $\frac{9}{20}$ l.

Of the antennæ, joints 1 and 2 are much stouter than any of the following six joints (which are of uniform thickness), 1 being much longer than 2; 4, 6, and 8 are equal *inter se*, and are the shortest joints; 3 is equal to 2 in length, 5 a little shorter, 7 nearly as short as 4, 6, and 8; 9 is strongly transverse, being scarcely longer than 8, but much wider; 10 is still more transverse, being a little longer than, and about twice as wide as, 9; 11 is ovate, being twice as long as 10, but scarcely wider; 9 and 10 each have a curved pencil of seta on either side at the apex.

Femina. A mare differt femoribus, metasterno, abdomineque simplicibus.

The antennæ of the female scarcely differ from those of the male except in being a trifle shorter.

South Australia; near Port Lincoln.

The species of *Eupines* described above may be thus tabulated.

A. Glabrous or nearly so.
  B. Antennæ unicolorous, or nearly so ... militaris.
  BB. Apical joint of antennæ pallid, in strong contrast to joint 10.
    C. Sutural apex of elytra simple.
      D. Front femora and tibiæ toothed in male ... ... nauta.
      DD. Front femora and tibiæ simple in male ... ... spiniventris.
    CC. Suture of elytra spiniform at apex ... ... nautoides.
AA. Body clothed with long erect setæ ... ... sororcula.

SILPHIDÆ.

CHOLEVA.

This genus seems to be fairly well represented in Australia; although only two species have been described. Of these *C. australis*, Er., may be distinguished from all other species known to me by the following characters in combination:—Colour and pubescence black; mesosternum finely carinate; prothorax and elytra transversely strigose. *C. obscurus*, Macl., has not been formally described—the only indication of its characters being a statement (Tr. Ent. Soc. N.S.W., II., p. 155) that it differs from *C. australis* in its pubescence being light coloured, and its prothorax and elytra longitudinally, instead of transversely, scratched or striolated. If it is to be inferred that the prothorax is *distinctly* striolate longitudinally (in the same manner that it is transversely in *C. australis*) I am confident that I have not seen the insect; if the reference be merely to the slight longitudinally striolate appearance resulting (in many species of the genus) from the direction of the adpressed hairs which clothe the surface, there is nothing in the description which would distinguish *C. obscurus* from any species (with one or two exceptions) of *Choleva* known to me. In this latter case it is impossible to describe any new species without running some risk of re-naming Sir W. Macleay's insect; subject to that remark, the following appear to be new. It may be noted that in the Australian species of *Choleva* having the mesosternum carinate (so far as my own observation goes) the carina is not a strongly elevated one like that of the European *C. sericeus*, Fab., but a very fine line running down the centre of the segment, and usually becoming obsolete in the front part; the front part, however, consisting of a sort of thickened transverse fold, which is more *elevated* than the carina, although not truly carinate (as in

many European *Choleva*, in which the mesosternum is non-carinate).

C. australis, Er. The specimens which I attribute to this species were taken in the neighbourhood of Adelaide. The only doubt I feel as to their identity is caused by the antennæ being a little stouter than seems quite consistent with the description, which, however, is very brief and general in respect of the antennæ. They are very much like those of the European *C. sericeus*, Fab., to which, indeed, the insect before me bears a very close general resemblance, differing chiefly in its more uniformly black colour (the base of the antennæ even being only a little pitchy), in its very much more finely carinate mesosternum, and in the more rounded sides of its elytra, which are decidedly dilated behind the base; the sculpture of the upper surface scarcely differs in the two species. I am doubtful of having seen the male of *C. australis*, as I do not find any decidedly sexual differences among the few examples I have examined, the tarsi of none of them being distinctly dilated

C. antipodum, sp. nov. Sat elongata; minus parallela; piceo-ferruginea (antennarum articulis basalibus 2 apicalique, capite antice, prothoracis lateribus, pedibus, et corpore subtus, dilutioribus); obscure piceo-pubescens; creberrime subtilissime punctulata; antennis gracilibus, articulo 8° quam 7^{us} tenuiori nec breviori; mesosterno antice simplici, inter coxas intermedias spiniformi. Long., $1\frac{3}{5}$ l.; lat., $\frac{7}{10}$ l.

The antennæ are considerably more slender than in any European species known to me of *Choleva* (*e.g.*, *C. agilis*, Illig.). They are conspicuously longer than the head and $\frac{1}{4}$ prothorax together. Joint 1 is much stouter and slightly shorter than 2; joints 3-6 are of equal thickness *inter se*, more slender than 2; 3 slightly longer than (4-6 each about equal to) 2; 7 slightly shorter and a little wider than 6; 8 as long as, but evidently narrower than, 7; 9 and 10 wider, and slightly shorter, than 8; 11 scarcely wider, but evidently longer, than 10, and acuminate at apex. I do not find any well-marked sexual characters. The mesosternal carina scarcely emerges forward from between the coxæ; the puncturation is finer and slightly closer than in (say) the European *C. tristis*, Panz.

Victoria; in the Alpine district, under fallen leaves.

C. Adelaidæ, sp. nov. Minus elongata; ovalis; ferruginea, capite prothoracisque disco obscurioribus; fulvo-pubescens; supra subtiliter (in prothorace subtilissime) transversim punctulato-strigosa; antennis sat brevibus robustis, articulo 8° quam 7^{us} et 8^{us} paullo angustiori multo breviori; mesosterno subtiliter carinato. Long., 1 l.; lat., $\frac{1}{2}$ l. (vix).

The antennæ are scarcely longer than the head and prothorax together, and seem in respect of robustness and build not very different from those of common European species (*e.g.*, *C. sericea*, Fab.). Joints 1 and 2 are stouter than those immediately following—1 evidently longer than 2 ; 3-6 moderately increasing in width (3 scarcely shorter than 2, 4 and 5 shorter subequal *inter se*, 6 considerably shorter ; 7-11 forming a subparallel club which is nearly as long as joints 1-6 together ; 7, 9, and 10 subequal *inter se* (each evidently wider than, and about twice as long as, 6) ; 8 same width as 6, but still shorter ; 11 subconical, a little longer and narrower than 10 ; joint 6 is strongly, and 8 very strongly, transverse. The sculpture of the upper surface is nearly as in *C. australis*, Er. In the male the front tarsi are pretty strongly (the basal joint of the intermediate tarsi scarcely, if at all) dilated. An example from Port Lincoln has the antennæ with the longer joints testaceous, the shorter one, piceous, but does not seem to differ otherwise.

South Australia ; in flood refuse near Adelaide, also near Port Lincoln.

C. Victoriensis, spec. nov. Sat elongata ; sat parallela ; piceo-ferruginea, antennarum basi prothoracis lateribus, pedibusque rufescentibus ; obscure pubescens ; capite prothoraceque subtiliter crebre, elytris minus subtiliter minus crebre, punctulatis ; antennis minus elongatis, sat robustis, articulo 8° quam 7^{us} et 8^{us} multo angustiori multo breviori ; mesosterno subtiliter carinato. Long., 1 l. ; lat., $\frac{2}{5}$ l.

The antennæ are perhaps a trifle longer than the head and prothorax together ; they are evidently more slender than those of *C. Adelaidæ*, but much stouter than those of *C. antipodum*. The basal six joints are proportioned *inter se* almost as in *C. Adelaidæ*, but are more slender ; 3-6 of equal width (not as in *Adelaidæ*, 4-5 each a little wider than its predecessor) ; joints 7-11 form a parallel club less noticeably wider than the basal part of the antennæ than in *Adelaidæ*, but with joints similarly proportioned *inter se* : owing to the much greater slenderness of the antennæ, however, joint 6 is not, and 8 is only moderately, transverse. The sculpture of the upper surface resembles that of *C. antipodum*, but is decidedly less fine on the elytra. In the male the front tarsi are strongly, and the basal joint of the intermediate tarsi is distinctly, dilated.

Victoria ; Alpine district, among fallen leaves.

C. minuscula, sp. nov. Vix elongata ; subovalis ; fusco-rufa, antennarum articulis intermediis, elytris abdomineque obscurioribus ; pubescens ; subfortiter minus confertim punctulata ; antennis fere ut *C. Victoriensis* sed fere gracilioribus ; mesosterno simplici. Long., $\frac{1}{5}$ l. ; lat., $\frac{2}{5}$ l. (vix).

The antennal joints are proportioned *inter se* almost exactly as in the preceding two species, the antennæ as a whole being, however, a trifle more slender than, but of about the same length as, those of *C. Victoriensis;* they are clearly less slender than those of *C. antipodum.* The puncturation of the upper surface is conspicuously less fine than in *C. Victoriensis.* In the male the front tarsi are only gently and the intermediate scarcely if at all dilated. The general appearance is very suggestive of the European *C. Wilkini*, Spence; but the puncturation is distinctly coarser, and the antennæ are more slender than in that species.

South Australia; widely distributed; in vegetable débris.

N.B.—The following is a tabulation of the described Australian species of *Choleva*, the only one omitted, so far as as I know, being *C. obscura*, Macl.

A. Mesosternum carinate.
  B. Antennæ of ordinary character.
    C. Prothorax transversely strigose.
      D. Size very small; colour not black... ... Adelaidæ, Blackb.
      DD. Size moderate; colour black ... ... australis, Er.
    CC. Prothorax not transversely strigose ... ... Victoriensis, Blackb.
  BB. Antennæ very long and slender antipodum, Blackb.
AA. Mesosternum simple ... ... minuscula, Blackb.

CHOLEVOMORPHA, gen. nov.

Gen. *Cholevam* simulat; differt trochanteribus posticis fere ut *Anisotomæ* formatis; tibiis omnibus spinosis; antennis gracillimis; maris tarsis anticis 3-unguiculatis.

This singular insect would have to be referred to the *Anisotomides*, on M. Lacordaire's arrangement, although its facies is much more that of the *Silphides.* The species before me has the appearance of a very wide robust *Choleva*, with extremely fine slender antennæ and variegated elytra. The antennæ are evidently longer than the head and prothorax together; all the joints are much longer than wide, and are thinly beset with longish fine setæ; of the basal six joints, joint 2 is the stoutest (1 being much longer, but scarcely so stout), 3-6 very slender (4-6 scarcely, 3 considerably, shorter than 1), 7-11 form a feeble club (being together very little shorter, but evidently stouter, than 3-6 together), and are somewhat equal *inter se*, except joint 8, which is much shorter and evidently more slender than the rest (nevertheless, joints 7 and 9 are evidently longer than 10 and 11). The mesosternum is not carinated, although it is very convex, and presents somewhat the appearance of coming to a ridge down the

middle line. In the male, the front tarsi have their basal joint triangular and strongly dilated, joints 2 and 3 dilated, but successively less so ; joint 4 is very small, 5 oval and dilated as long as the preceding three together ; joint 5 bears at its apex three unequal claws, of which one (the longest) is inserted immediately before the apex, and is strongly curved and scarcely shorter than the apical joint of the tarsus, while the other two are *at* the apex and are much shorter—one shorter than the other. The intermediate tarsi of the male are considerably longer than the front, and scarcely shorter than the hind, ones ; these four posterior tarsi scarcely differ *inter se*, except that the basal joint of the intermediate is evidently dilated. In both pairs, joints 1 and 5 are of equal length, and each as long as joints 2-4 (which are subequal *inter se*) together. The claws are obtusely subdentate at the base. The spines on the front tibiæ are fine and inconspicuous ; those on the four posterior strong and well defined. All the tibiæ are bispinose at the apex. The female scarcely differs from the male, except in having the anterior four tarsi and the front claws simple.

The superficial sculpture of the insect on which I am founding this genus is very unusual, and extremely like that of *Catops australis*, Er. I have examples of the latter species (or a very close ally of it) in my collection and, notwithstanding this curious resemblance, find that it cannot be associated generically with this new form ; it appears to me to be a true *Choleva*.

C. picta, sp. nov. Sat late ovalis ; parce pubescens ; nigra, antennarum basi, prothorace antice et latera versus, elytrorum maculis nonnullis, pedisbusque, plus minus testaceis vel rufis ; prothorace minus crebre granulato, fortiter transverso antice fortiter angustato, angulis posticis retrorsum vix productis; elytris crebre transversim punctulato-striatis, stria suturali sat fortiter impressa. Long., $1\frac{2}{5}$ l. ; lat., $\frac{4}{5}$ l.

The pale markings on the elytra are not at all strongly defined in themselves, but are rendered conspicuous by their being clothed with golden pubescence ; they consist of a large humeral blotch, a smaller common spot on the suture some distance behind the scutellum, two smaller spots on the front part of the disc, and an irregular narrow fascia of zigzag form about the middle. In some examples some of the markings are wanting.

Victoria ; among fallen leaves on the higher mountains (Feathertop, &c.).

SCAPHIDIIDÆ.

SCAPHIDIUM.

S. alpicola, sp. nov. Nitidum ; nigrum ; prothorace (margine basali et maculis 2 discoidalibus ante medium positis nigris

exceptis), elytrorum fasciis binis suturam versus abbreviatis, pygidio (macula nigra excepta) et corpore subtus (prosterno medio, mesosterno, metasterni lateribus margineque postico, et abdominis basi nigris exceptis) rufis ; oculis minus approximatis ; prothorace postice linea transversa arcuata punctulata instructo, lateribus fere rectis ; elytrorum sutura et ad basin linea arcuata punctulata impressis, his in medio disci punctura rum seriebus 2 antice et postice abbreviatis instructis.

Maris tibiis anticis elongatis, basi fortiter arcuatis ; metasterno punctulato pubescenti, utrinque pilis longissimis penicillam formantibus. Long., $2\frac{1}{2}$ l. ; lat., $1\frac{1}{5}$ l.

Colour and markings have been so much relied on in most of the descriptions of Australian *Scaphidia* that it is difficult to specify distinctions other than colour in adding a new species. I have seen several specimens of the insect before me, which I took in decayed wood. Its colouring comes nearest to *S. exornatum*, Oberthür (known to me only by description). In that species the base of the antennæ is said to be red, the femora partly red, the underside (except the apex) black, and the markings of the elytra appear to consist of black spots on a red derm ; all these differences point clearly, I think, to specific distinctness—but even if the present insect should be an Alpine form of an already named species, it would be desirable to give it a var. name, as all the examples I have seen are quite identical in colour and markings.

Victoria ; in the Alpine district.

SCAPHISOMA.

S. novicum, sp. nov. Obovatum ; nitidum, sparsim valde levitea punctulatum ; nigrum, palpis antennarum basi pedibus et elytrorum apice testaceis vel rufis ; scutello vix manifesto ; elytrorum stria suturali prope basin extrorsum arcuata.

Maris metasterno utrinque postice longitudinaliter profunde sulcato, segmento ventrali penultimo minus abbreviato. Long., $\frac{4}{5}$ l. ; lat., $\frac{2}{5}$ l.

This species is scarcely distinguishable except by its smaller size, much more feebly impressed (though otherwise very similar) puncturation, and sutural stria bent outward at the base, from the European *S. agaricinum*, Leach. The sexual characters of *S. agaricinum*, however, do not seem to have been recorded, and my type of that insect is a female, so I cannot say whether they are similar to those of *S. novicum*. The male example of the latter, from which I have described what I suppose to be sexual characters is immature (it is almost uniformly testaceous in colour), but I do not think the metasternal characters mentioned

above can be due to immaturity as they are quite symmetrical on either side. It was taken in company with the other specimens.

Victoria; Alpine district, in fungi.

HISTERIDÆ.

CHLAMYDOPSIS.

I feel some hesitation in referring the following two species to this genus, nor do I feel sure that they ought not to be regarded as members of *two* allied genera, both distinct from *Chlamydopsis*. They certainly, I think, appertain to the *Histeridæ*, and they agree very fairly with Professor Westwood's characters of the said genus (I do not feel quite satisfied whether the antennæ have eight or nine joints) as far as those characters go, but it appears to me that if those characters were drawn up from a species at all closely allied to those before me, they do not sufficiently indicate the extraordinary appearance of the insects, which are among the most wonderful I have ever seen. The two examples before me differ very strongly *inter se* (probably they are male and female of two species), but they agree in the remarkable relation of the head and prothorax to each other—a character so singular that I do not like to separate them generically. The head, including the antennæ, exactly fits into the cavity of the prothorax, without protruding from it in the smallest degree, so that in repose the insect appears to have no head, and when looked at from in front the appearance is of the cavity of the prothorax being stopped by an even vertical plate. If the antennæ be drawn out (no easy task!) the head is visible—the cavity of the prothorax being looked at from in front—occupying the middle portion of the cavity, and having on either side of it a large cavern, which is exactly filled by an antenna when the insect is in a state of repose. The antennæ are on the same plan as those of the *Dynastid*-genus *Cryptodus*, consisting of a large lamelliform basal joint (which is the joint that forms the door of the aperture of the antennal cavity), into the hind surface of which is inserted a very short stem,* at the end of which is a very elongate club, consisting of a single joint. All the tarsi fit completely into cavities in the tibiæ; the front tibiæ fall into grooves of their femora, the front legs fit completely and exactly into cavities at the sides of the prosternum. The whole upper surface is uneven, in a manner defying exact description. The body is furnished with wings. The prosternum is produced anteriorly as in the "Histérides vrais" of Lacordaire. The prosternum and mesosternum present truncate and closely applied faces to each other.

* As already noted, I cannot satisfy myself whether this consists of six or seven joints; but seven is the more probable number.

In the above characters the two examples before me coincide; they differ very widely in the nature of the inequalities of the surface; in one of them having the hind legs developed to such an extraordinary degree that these are longer than the body, while the hind tibiæ are strongly compressed, and dilated to such an extent that their greatest width is scarcely less than half the width of the prothorax; and in one of them having lateral depressions for the reception of the posterior legs.

It will probably be observed that these characters come very near those of Archdeacon King's genus, *Byzenia*, which that learned author attributes to the *Byrrhidæ* (Tr. Ent. Soc. N.S.W., II., p. 74). I have very little doubt that *Byzenia* is really very near the species I am describing (or that it is a *Histerid*), but the Archdeacon says its "legs are not received into cavities," and this is, perhaps, inconsistent with generic identity. In the description of *Chlamydopsis*, Professor Westwood implies (though he does not state it quite categorically) that there are no cavities for the reception of the legs, and, therefore, I suspect *Byzenia* and *Chlamydopsis* are identical (the memoirs characterising them were read in the same year; I believe Westwood's was published before the other). As regards the insects before me, the existence of cavities to receive some or all of the legs would perhaps justify their having a new generic name (or names), but as they are clearly close allies of *Chlamydopsis* I do not think any confusion will arise if I attribute them to the latter genus in the doubt as to the relation of its legs to the body.

I believe the two species described below to be parasitic on fossorial *Hymenoptera*, as I found them both (in different years and different places) on the top of rotten fence posts in which *Hymenoptera* were making their nests.

C. sternalis, sp. nov, Mas (?). Subopaca; piceo-ferruginea, antennis pedibus elytrisque dilutioribus; subtiliter punctulata et strigosa, puncturis strigisque confuse intermixtis, illis squamas minutas ferentibus; prothoracis lateribus fortiter bisinuatis, disco a basi ad apicem gradatim elevato cristam magnam formanti (cristæ apice subbifido, lateribus declivibus longitudinaliter bisulcatis, facie anteriori verticali subnitida punctata); scutello haud perspicuo; elytrorum humeris valde callosis; pygidio propygidioque verticalibus; pedibus brevibus; prosterno medio longitudinaliter late fortiter carinato, carina media longitudinaliter profunde sulcata. Long., $1\frac{1}{5}$ l.; lat., $\frac{4}{5}$ l. (vix).

The posterior four tibiæ are triangular; the apex of the triangle being regarded as the point of attachment to the femur, its longest side is the inner margin, and its other sides (subequal) are the external margin of the tibia and the obliquely truncate apex of

the same. The front tibiæ are not very different, but their external margin is distinctly shorter than their obliquely truncate apex, and forms an obtuse tooth at the point of junction with the latter. The legs are about of equal length *inter se*—all evidently shorter than (say) the length of the elytra.

Sonth Australia; near Woodville.

C. inæqualis, sp. nov. Femina (?). Minus opaca; piceo-ferruginea, antennis dilutioribus; crassissime punctulato-strigosa (elytrorum parte basali media, metasterno, abdominisque segmentis basalibus et apicalibus, subtiliter, fere ut *C. sternalis*, sculpturatis exceptis), abdominis parte intermedia fere lævi; prothorace antice valde reflexo elevato-marginato (margine elevato 6-lobato, lobis intermediis 4 quam externi minus elevatis multo minus latis), margine antico quam basis sat latiori, lateribus mox pone marginem anticum retrorsum convergentibus hinc ad basin parallelis; scutello haud perspicuo; elytrorum humeris externe spiniformibus, callis humeralibus maximi gibbosis, parte basali mediana valde depressa (hac subtiliter sculpturata), a parte postica (hac crassissime sculpturata) sulco profundo transverso divisa; pygidio propygidioque rotundatim subverticalibus; pedibus anticis 4 quam elytra (posticis quam corpus totum) longioribus; prosterno æquali. Long., 2 l. (vix); lat., 1 l.

The six lobes into which the strongly upturned front margin of the prothorax is divided are not very apparent unless the outline be looked at obliquely from behind, or from in front. The tibiæ (allowing for the much greater length of the legs) are shaped very much as those of *C. sternalis*, except that the external margin of the intermediate pair meets the truncate hind margin (as in the front pair) in a strong obtuse tooth, and that the external margin of the hind pair is very much longer than the truncate hind margin.

South Australia; near Woodville.

PHALACRIDÆ.

The only Australian species that I can ascertain to have been already described belonging to this family is *Phalacrus brunneus*, Er., from Tasmania, for which, together with *Sphæridium testaceum*, Fab., Dr. Erichson (Ins. Deutsch. III., p. 108) founded a new genus—*Litochrus*. In 1889 a revision of the family, with especial reference to the N. American species was published in the Annals of the New York Academy, in which *Litochrus* seems to have been re-described. I have not been able to consult this memoir, but from the notice of it in the "Zoological Record," I should infer that neither of the species attributed to *Litochrus* by Erichson has been removed from it. I will, however, take the

precaution of saying that the following species placed in this genus are, no doubt, congeneric with *L. brunneus*, Er. That insect is, unfortunately, not very minutely described by its author; I do not think, however, that any of the species described below can be identical with it. *L. alternans* is the one that comes nearest to it, but it does not seem likely that if Erichson had had that insect before him he could have failed to mention the conspicuous sculpture of its alternate interstices.

LITOCHRUS.

L. laticulus, sp. nov. Breviter ovalis; postice vix angustatus; nitidus; niger; capite antice, elytrorum apice et utrinque macula magna discoidali, antennis, palpis, prothorace lateribus, corpore subtus et pedibus rufo-testaceis; capite prothoraceque vix perspicue punctulatis; elytris vix striatis, striis interstitiisque subtilissime punctulatis. Long., 1 l.; lat., $\frac{3}{5}$ l.

The pale markings on the elytra consist of a wide curved blotch commencing on either shoulder and proceeding towards the suture and almost touching it at the middle of its length; the pale apex of the elytra is produced forward on either side in such fashion that it almost touches the exterior hind corner of the discal blotch. The pale colouring occupies almost as much area as the black; the latter forms a large triangle, the base of which is the base of the elytra, and its apex is produced narrowly down the suture to about the middle where it dilates into a large blotch; there is also a large black space on either side, which is continuous along the base with the black of the suture.

Victoria; Alpine district.

L. Palmerstoni, sp. nov. Breviter ovalis; postice leviter angustatus; nitidus; ferrugineus; antennis, palpis, elytrorum apice, pedibus, et corpore subtus, testaceis; vix perspicue punctulatus; elytris vix striatis. Long, $\frac{4}{5}$ l. (vix); lat., $\frac{1}{2}$ l.

This minute insect appears to be a typical *Litochrus*. Its uniform ferruginous colour, with the apex of the elytra pale testaceous, and almost impunctulate surface, will, I think, distinguish it from all its described congeners.

N. Territory of S. Australia; near Palmerston.

L. alternans, sp. nov. Ovalis, postice attenuatus; nitidus; supra lividus, hic illic infuscatus, cœruleo-iridescens, antennis palpis pedibus et corpore subtus testaceis; capite prothoraceque subtilissime crebre punctulatis, hoc puncturis nonnullis majoribus hic illic impresso; elytris, vix striatis, striis puncturis minutissimis sat crebre impressis, interstitiis alternis sublævibus et puncturis sat magnis seriatim sparsim instructis. Long., $1\frac{1}{2}$ l.; lat., $\frac{4}{5}$ l.

This species seems to be well distinguished by its peculiar puncturation—very fine, close, and evenly distributed—the prothorax bearing also a few scattered punctures evidently much larger; and the elytra having their scarcely marked striæ closely set with excessively fine punctures, while a conspicuous row of considerably larger and widely spaced punctures runs down interstices 1, 3, &c., 2, 4, &c., being almost lævigate; thus the widely spaced punctures of the alternate interstices are much the strongest sculpture of the elytra.

Victoria; Alpine district.

L. maculatus, sp. nov. Breviter ovalis; postice vix angustatus; nitidus; piceus; antennis, palpis, pedibus, capite antice, corpore subtus, et macula magna triangulari communi in elytrorum medio posita, testaceis; capite prothoraceque creberrime subtilissime punctulatis; elytris vix striatis, striis puncturis subtilibus seriatim impressis, interstitiis alternis sublævibus et puncturis sat perspicuis seriatim sparsim instructis. Long., 1 l.; lat., $\frac{3}{5}$ l. (vix).

The colouring of this species (which seems to vary only a little in intensity, and in the elytra of some examples being reddish towards the apex) will, I think, distinguish it from all its congeners. Its sculpture is very like that of *L. alternans* (though the punctures in the alternate interstices are scarcely larger than in the striæ), but its size and shape, as well as its markings, are very different and seem to be constant. A short series taken in the Victorian Alps seems attributable to this species, although the specimens vary greatly in size, some being quite twice as large as the South Australian examples; the red spot common to the elytra is, moreover, in most of this Victorian series (especially in the larger examples) evidently less conspicuous.

S. Australia; common in the Port Lincoln district.

L. suturellus, sp. nov. Breviter ovalis; postice parum angustatus; nitidus; piceus vel rufo-piceus; antennis, palpis, prothoracis et elytrorum marginibus (sutura inclusa), corpore subtus, pedibusque, testaceis; capite prothoraceque subtilissime confertim (parum perspicue) punctulatis; elytris vix striatis, striis subfortiter punctulatis, interstitiis (præsertim suturam versus) confuse perspicue punctulatis. Long., $\frac{3}{5}$-1 l.: lat., $\frac{1}{3}$ l.-$\frac{3}{5}$ l. vix).

This species may be distinguished from the others known to me by the conspicuous paleness of its suture, which seems to be constant; it may be known from the two preceding by the much more strongly punctured striæ of its elytra and the quite different style of the puncturation of the interstices, which does not vary alternately, but becomes gradually feebler from that nearest the

suture (where it is nearly as strong as in the striæ) towards the external margin, the interstices between the middle of the elytra and the margin being scarcely visibly punctulate. The sculpture of the elytra is very much as in the European *Phalacrus caricis*, Sturm., the punctures in the striæ and in the inner interstices being about as they are in that species. The punctures in the *striæ* scarcely become feebler towards the lateral margin, nor are they very much finer even close to the apex.

Western Australia.

L. lateralis, sp. nov. Breviter ovalis ; postice parum angustatus ; nitidus ; piceo-niger, capite et elytrorum apice paullo rufescentibus, antennis palpis pedibus et corpore subtus testaceis (his nonnullis exemplis paullo infuscatis) ; capite prothoraceque confertim perspicue punctulatis ; elytris vix striatis, striis subfortiter punctulatis ; interstitiis omnibus æque confuse perspicue punctulatis. Long., 1—1⅖ l. ; lat., ⅗—⅘ l.

var ? *major* ; prothorace sat late rufo-cingulato. Long., 1⅘ l. ; lat., 1 l.

This species is larger than *L. suturellus*, and is very differently coloured ; in shape and sculpture the two are very similar, except in *L. lateralis* having the lateral interstices of its elytra punctured quite as strongly as the interstices near the suture.

South Australia ; near Port Lincoln. The var ? *major* was taken near Adelaide.

L. frigidus, sp. nov. Sat breviter ovalis, postice parum angustatus ; nitidus ; antennarum clava, capite, prothoraceque (lateribus rufescentibus exceptis), nigris ; elytris rufescentibus hic illic infuscatis ; ceteris rufo-testaceis ; capite prothoraceque subtilissime confertim punctulatis ; elytris vix striatis striis subfortiter punctulatis, interstitiis omnibus obscure punctulatis. Long., 1 l. ; lat., ⅗ l.

The most noticeable character of this species is the black club of its antennæ, of which moreover the stem is more slender than in the other species known to me of *Litochrus*, with the seventh joint scarcely, if at all, longer than the sixth. In the other species I have not found any very available antennal distinctive characters, but they all seem to have the seventh joint distinctly longer than the sixth, and also the third conspicuously elongated. The fact is the antennæ (owing to the compression of the apical joints, which seem more convex moreover on one of the compressed faces than the other) appear different in two examples of the same species unless they are absolutely similarly brushed out, and in these minute insects it is difficult to be sure one has attained this result. The puncturation of the elytra in this species is not much different from that of *L. lateralis*, but owing to the ex-

tremely shining surface and lighter colour of the elytra, the puncturation is less noticeable unless examined under a powerful magnifier.

Victoria ; a single example embedded in snow on one of the higher mountains.

LITOCHRUS (?)

The next two species represent a type which can hardly stand as truly congeneric with the preceding, as the tibiæ are devoid of apical spines, and the basal joint of the hind tarsi is shorter than the second. It agrees with *Litochrus* in having the hind tarsi evidently longer than the intermediate, in its metasternum produced to the extent of concealing the mesosternum, and in its subglobular front (and adjacent hind) coxæ, &c., &c. I should have no hesitation in founding a new genus for it were it not that I have not been able to consult the diagnoses of the new American Phalacrid genera already referred to, and it is possible that it may pertain to one of them. I find that in the species before me, the clypeus is somewhat more developed than in the preceding, encroaching somewhat on the labrum.

L. (?) alpicola, sp. nov. Nitidus ; subcuneiformis ; postice fortiter angustatus ; obscure rufo-testaceus, capite prothoraceque subinfuscatis ; his leviter sat crebre punctulatis ; elytris vix striatis, striis subtiliter perspicue (interstitiis subtilissime seriatim) punctulatis. Long., 1 l. ; lat., $\frac{3}{5}$ l.

The most distinctive specific character of this insect seems to be its shape, the sides converging strongly in a curved manner hindward from close to the base of the elytra. The puncturation of the head and prothorax is decidedly less fine than in any of the species of *Litochrus* described above, but it is very faintly impressed.

Victoria ; Alpine district.

L. (?) uniformis, sp. nov. Latus ; fere rotundus ; ferrugineus ; sublævis ; elytrorum stria suturali postice manifeste impressa. Long., $\frac{4}{5}$ l. ; lat., $\frac{7}{10}$ l. (vix).

The whole surface under a powerful Coddington lens shows scarcely a trace of sculpture of any kind—merely the faintest indication of very minute puncturation—except the sutural stria of the elytra, which is moderately defined in the hinder two-thirds of its length. In the example before me all the margins (including the suture) of the elytra are narrowly and obscurely infuscate.

S. Australia ; near Adelaide.

PHALACRINUS (gen. nov.).

A *Phalacro* differt antennarum clava sat laxe articulata, clypeo antice producto labrum obtegente, mesosterno late manifesto a metasterno haud obtecto, coxis anticis minus globosis, tarsis brevibus inter se longitudine sat æqualibus, his vix perspicue 5-articulatis, posticorum articulo 2° quam 1^us^ paullo breviori.

This genus has quite the facies of *Phalacrus*, but as will be seen by the above diagnosis there are structural peculiarities which almost suggest hesitation in placing it in the family *Phalacridæ*: especially the extreme indistinctness of the 4th tarsal joint, and the feeble globosity of the front coxæ.*

P. australis, sp. nov. Nitidus; subcuneiformis; postice fortiter angustatus; testaceus; elytris plus minus infuscatis; sublævis, elytris distincte striatis, striis postice (externis totis) punctulatis, interstitiis postice subconvexis. Long., $1\frac{1}{5}$ l.; lat., $\frac{7}{10}$ l.

The interval between the outermost stria and the lateral margin of the elytron is very wide anteriorly (about two-fifths of the width of the whole elytron); but it narrows hindward very quickly, and is in the hinder half of its length of almost uniform width, and less than half as wide as in front. Each elytron bears 9 striæ, none of which quite reach the base except the 4th, 5th, 6th, 7th, and 8th, and of *these* only the 7th and 8th are more than very faintly indicated close to the base. The striæ become deeper and more strongly punctulate successively from the suture toward the lateral margin, and also from the base hindward, the puncturation of the 3 or 4 striæ nearest the suture being scarcely indicated in front. The 9th stria terminates in front by running rather indistinctly into the 8th considerably behind the base of the elytron, and the 7th and 8th are connected on the base. (In some examples, however, the anterior inflected part of these striæ is scarcely traceable, so that the 8th and 9th striæ seem to terminate independently) The infuscation of the elytra is

* Since writing these remarks I have had the advantage of receiving a communication from Mr. A. Sidney Olliffe, the Colonial Entomologist of N.S.Wales, who has been kind enough to examine a specimen of *P. australis* for me. Mr. Olliffe is a high authority on the Clavicorn genera, whose opinion is much more valuable than mine. He regards what I have taken to be a minute 4th joint of the tarsi as merely a basal dilation of the apical joint, and cannot discover a suture. I have no doubt he is right, and that my observation was incorrect. Apart from this difficulty, Mr. Olliffe would be disposed to refer the insect to the *Phalacridæ*, but regards this objection as a very serious one. However, as it seems to me that *Phalacrinus* would be much more out of place in any other family, I have thought it on the whole best to let it stand where I have placed it, and at the same time to record the notes with which Mr. Olliffe has favoured me.

variable, it appears never to extend to the portion between the 9th stria and the lateral margin; in some examples it consists merely in the *striæ* being darker than the general colour, and in others it suffuses nearly the whole disc. The sculpture (excluding the punctulate striæ of the elytra) is so fine that the insect may almost be called lævigate, but the space between the 9th stria and the lateral margin is a little more distinctly punctulate than the general surface. On the underside the puncturation is not much more distinct than on the upper surface except on the sides of the metasternum, where it is moderately defined.

S. Australia; Port Lincoln, also near Morgan.

P. obtusus, sp. nov. Latus; postice quam antice parum fortius angustatus; elytrorum striis minus perspicue punctulatis; cetera ut *P. australis*. Long., $1\frac{1}{5}$ l.; lat., $\frac{4}{5}$ l.

The difference of this insect from the preceding in respect of shape strikes the eye at once, this being at its widest scarcely in front of the middle, and being not much more narrowed hindward than in front, while in *australis* the greatest width is considerably in front of the middle, and the front part of the insect is wide and obtuse, with the hinder part strongly narrowed. In *obtusus* none of the striæ are distinctly punctulate, while in *australis* the external striæ are dotted with well-defined isolated punctures.

S. Australia; near Port Lincoln.

P. rotundus, sp. nov. Rotundus; brevis; elytris haud longioribus quam conjunctim latioribus; his margine laterali latissimo, striis minus crebre punctulatis; cetera ut *P. australis*. Long., 1 l.; lat., $\frac{4}{5}$ l.

This species is exceedingly close to the preceding two, but its shape is so distinctly different that I cannot regard it otherwise than as a good species. Its outline is nearly a circle, the elytra down the suture being (by measurement) not at all longer than they are together wide at their widest part; in the preceding two species they are distinctly longer than together wide. The interval between the 9th stria and the lateral margin is in *P. rotundus* distinctly wider than in the preceding two species, especially in its hinder part. The puncturation of the striæ is stronger than in *P. obtusus*, and the punctures are less closely placed than in *P. australis*.

S. Australia; near Port Lincoln.

PHALACRUS.

P. corruscus, Panz. A *Phalacrus* occurring commonly in South Australia, and which I have met with in Victoria also, appears to me incapable of separation from this European species.

P. Burrundiensis, sp. nov. Breviter obtuse ovalis ; convexus ; nitidissimus ; niger ; antennis pedibusque piceis ; elytris perspicue striatis, interstitiis puncturis sat subtilibus biseriatim leviter impressis ; antennarum clava minus elongata, articulo ultimo præcedentibus 2 conjunctis vix longitudine æquali, apice minus acuminato. Long., $1\frac{1}{5}$ l. ; lat., $\frac{4}{5}$ l.

This species is very like *P. corruscus*, Panz., but differs in being an evidently wider insect in proportion to its length, in its more evenly rounded sides—the greatest width of the body being a little behind, rather than at, the base of the elyrta—and in the last joint of the antennæ being scarcely so long as the preceding two together, and being of more conical form, with the apex blunt. The puncturation of the elytra, too, when attentively examined, is seen to be different. In *corruscus* it is fine, close, and even, there being no striæ (except the sutural one), and scarcely a trace of longitudinal arrangement in any part of the puncturation. In the present species the elytra are very feebly striated throughout, the striæ for the most part running in pairs (each pair very close together), and the spaces between the several pairs of striæ (which are much wider than those between the striæ of each pair) bear each two rows of punctures, which are very faintly impressed rather than very fine, but are quite discernible under a good lens. In the example before me the apical joint of the antennæ is obscurely testaceous.

Northern Territory of S. Australia.

OLIBRUS.

O. Victoriensis, sp. nov. Latus ; breviter ovalis ; nitidus ; testaceo-rufus ; capite postice et prothorace (lateribus et basi exceptis) obscurioribus ; capite prothoraceque subtilissime confertim punctulatis ; elytris punctulato-substriatis, interstitiis perspicue minus crebre punctulatis. Long., $1\frac{1}{4}$ l. ; lat., $\frac{4}{5}$ l.

This insect seems to possess all the characters of *Olibrus*, the hind tarsi longer than the intermediate, with basal joint shorter than the second, tibiæ having apical spines, &c., &c. Compared with *O. corticalis*, Sch., it is a good deal wider in proportion to its length, and is considerably less attenuated behind, and less convex ; the puncturation of its elytra is as strong in the interstices as in the striæ, and is slightly stronger than in *Phalacrus caricis*, Sturm.

Victoria ; in the Alpine district.

NITIDULIDÆ.

In recently working through the specimens belonging to this family in my collection, I have been surprised to find how little

use describers have made of the presence or absence (and the shape) of a piece of the under-surface which is, I suppose, the epimeron of the mesosternum, and which in some genera assumes a remarkable position and form ; in *Meligethes (e.g.)* it appears as a triangular plate separating from each other in the front half of their length the metasternum and the metasternal episternum. As I am not quite sure that I am right in deeming it the mesosternal epimeron, I propose in the following descriptions, &c., where I have occasion to refer to this piece, to call it the "intermediate plate," so as to avoid the risk of giving it a misleading name. I have looked through several works on the *Nitidulidæ (e.g.*, Reitter's "Systematische Eintheilung der Nitidularien," the chapter on the "Nitidulaires" in the "Genera des Coléoptères," the corresponding chapter in the "Insecten Deutschlands") without having found any discussion of this character—although I have no doubt it has been remarked by someone, if I could hit the right author. I have not access to a sufficiently large collection of *Nitidulidæ* to be able to say how far this character would be available for purposes of classification in general ; but so far as concerns the Australian species and such European and American ones as are respresented in my collection, the interposition of this "intermediate plate" between the metasternum and its episterna, and also its shape when so interposed, appear to be distinctive of genera. I have examined a considerable number of specimens of the following genera, and find this "intermediate plate" in Cychramptodes, Meligethes, Pria, Macroura, Gaulodes, Nitidula, Cychramus, Ips (all well defined) ; and in Amphotis and Pocadius feebly discoverable ; while in the Brachypterides, Carpophilides, Epuræa, Haptoncus, Haptoncura, Soronia, and Omosita I do not find it at all discernible.

Another character that might, I think, be much used with advantage in classifying the *Nitidulidæ* is the degree of coarseness of granulation of the eye. So far as I have been able to investigate the matter the granulation of the eyes in this family is of three distinct types. It is more or less fine in the Brachypterides, Carpophilides, Epuræa, Haptoncus, Haptoncura, Nitidula. Amphotis, Omosita, Meligethes, Pocadius, Macroura, Pria, Ips. In the other genera, viz., Soronia, Gaulodes, Lasiodoctylus, Cychramptodes, Idæthina, Æthinodes, Cychramus, it is coarser ; but of those with more coarsely granulated eyes *(i.e.*, with the facets large) some have the individual facets almost flat *(e.g.*, Gaulodes, Cychramptodes), while others have them more or less strongly convex, *Idæthina* (presuming my identification of that genus to be correct) standing pre-eminent in respect of that character.

HAPTONCURA.

H. Victoriensis, sp. nov. Ovalis; pubescens; testacea, prothoracis disco utrinque, antennarum articulis ultimis 4 vel 5 vel 6, et elytrorum disco, infuscatis; confertissime minus subtiliter punctulata; prothorace quam longiori duplo latiori, antrorsum angustato, antice leviter emarginato, lateribus ab apice ad basin gradatim magis late reflexo-marginatis, angulis posticis bene determinatis retrorsum subproductis. Long., $1\frac{2}{5}$ l.—$1\frac{1}{2}$ l.; lat., $\frac{3}{5}$—$\frac{4}{5}$ l.

This species has entirely the facies of an European *Epurea*, but clearly belongs, I think, to the genus (or subgenus) *Haptoncura*. Its pubescence and puncturation scarcely differ from the same in *E. pusilla*, Hbst. Compared with that species it is much less elongate and parallel (more like *E. deleta*, Er., in outline), with the sides of the prothorax much less widely reflexed (especially in front), the elytra less widely margined, tibiæ with apical spines, &c.

Of Australian *Haptoncuræ*, no doubt *imperialis*, Reitt, is its nearest ally. I have not, so far as I know, seen that species (the exact habitat of which is not known), but it evidently differs from it in many characters, of which I may specify the puncturation no doubt much stronger (*imperialis* is said to be "subtilissime punctulata"), the front of the prothorax less strongly emarginate, &c. The colours and markings, too, are evidently different, the prothorax having in *imperialis* on either side a black discal vitta, abbreviated in front; this species an elongate blotch (often almost obsolete), not more abbreviated in front than behind; the elytra in typical specimens of *imperialis* having (among other markings) a large common triangular, basal, dark spot. Of the present species I have seen nothing like this in any specimen, but ordinarily there is a large dark spot occupying the greater part of the disc of each elytron, nearly reaching the suture and lateral margin, and widely separated from the base and apex. This spot is liable to be altogether wanting (rarely), or extended over the whole elytron, except the lateral margin. The females are proportionally much broader and more robust than the males.

Victoria; on flowers in the Alpine district.

H. Lindensis, sp. nov. Ovalis; pubescens; testacea vel rufa; elytris maculatim et corpore subtus, plus minus infuscatis; leviter (in prothorace sat crebre in elytris magis sparsim) punctulata; prothorace quam longiori vix duplo latiori, antrorsum sat angustato, antice subbisinuato, lateribus angustissime reflexo-marginatis, angulis posticis sat rotundatis. Long., $\frac{4}{5}$—$1\frac{1}{5}$ l.; lat., $\frac{2}{5}$—$\frac{3}{5}$ l.

This little species is evidently closely allied to *H. liliputana*,

but differs *inter alia* in its less closely punctured prothorax, with rotundate-obtuse hind angles. From the two other previously described Australian species, and from *H. Victoriensis*, it differs in the very narrow margins of its prothorax. The infuscation of its elytra (which is never clearly defined) consists of a shading round the scutellum and a vitta down the disc of each elytron, which is dilated near, but does not reach, the apex ; this vitta is liable to be broken into several small patches, or even to be scarcely discernible, and in some examples the shading round the scutellum is very faint. In some examples the underside is entirely rufous, in others the metasternum or hind body, or both, may be more or less infuscate. The puncturation, I regret that I cannot compare satisfactorily with that of any well-known species ; the prothorax is finely alutaceous, and on this surface it is (by no means closely) pitted with faintly impressed, but not very small, punctures ; the punctures on the elytra are still more sparse and faint.

S. Australia ; common on flowers near Port Lincoln.

H. Meyricki, sp. nov. Ovalis ; pubescens ; testacea vel rufa ; elytris et corpore subtus plus minus infuscatis ; prothorace confertim sat subtiliter punctulato, quam longiori minus duplo latiori, antrorsum angustato, antice bisinuato, lateribus angustissime reflexo-marginatis, angulis posticis rotundato-obtusis ; elytris sparsim leviter punctulatis. Long., 1 l. ; lat., $\frac{1}{2}$ l.

This species is very like *H. Lindensis*. I do not find any noteworthy difference in the colours, except that in ordinary types of this the infuscation of the elytra is almost confined to the region of the scutellum, and that the general colour of the elytra is distinctly paler than in *H. Lindensis*. It can be at once distinguished from *Lindensis* by the much closer and less faint puncturation of the prothorax, and from *H. liliputana*, Reitt., by its different colour, less transverse prothorax, &c.

W. Australia ; taken by Mr. E. Meyrick.

H. uniformis, sp. nov. Ovalis ; vix pubescens ; rufo-brunnea vel nigro-brunnea ; antennis palpis pedibusque rufis ; minus subtiliter subsparsim æqualiter punctulata ; prothorace quam longiori minus duplo latiori, antrosum angustato, antice subbisinuato, lateribus angustissime reflexo-marginatis, angulis posticis rotundato-obtusis. Long., 1 l. ; lat., $\frac{1}{2}$ l.

The unicolorous dark reddish or blackish brown colour of this species seems to be distinctive, as also its evenly distributed puncturation, which is evidently stronger than in the preceding two species.

Victoria ; on flowers in the Alpine district.

N.B.—As the last three species described above have a considerably different facies from *Epurœa*, owing to the very narrow lateral margins of their prothorax, I should have hesitated to refer them to *Haptoncura*, were it not for their being evidently close allies of *H. liliputana*, Reitter. It will perhaps be well to mention that they possess the characters which in Herr Reitter's tabulation of the *Nitidulidæ* (verh. ver. Brünn, 1873) would refer them to *Epurœa* (from which genus *Haptoncura* has since been separated), viz., prosternum not produced hindward, tarsi dilated, elytra nearly covering the pygidium, labrum emarginate, apex of mandibles simple, and in addition the tibiæ distinctly spined at the apex and other characters distinguishing *Haptoncura*.

The described Australian species may be thus tabulated :—

A. Lateral margins of prothorax widely reflexed.
  B. Elytral markings consisting of a dark vitta ... ... Victoriensis, Blackb.
  BB. Elytra not marked as in *Victoriensis* ... ... { imperialis, Reitt., subquadrata, Reitt.

AA. Lateral margins of prothorax extremely narrow.
  B. Prothorax rectangular at base (colour uniformly testaceous) liliputana, Reitt.
  BB. Hind angles of prothorax more or less roundly obtuse.
    C. Prothorax and elytra differently punctured *inter se*.
      D. Prothorax closely punctured ... Meyricki, Blackb.
      DD. Prothorax faintly and less closely punctured ... Lindensis, Blackb.
    CC. Puncturation of upper surface quite uniform uniformis, Blackb.

NITIDULA.

N. quadripustulata, Fab. This species (doubtless imported) is not uncommon in the neighbourhood of Adelaide. I have not seen any previous notice of its occurrence in Australia.

SORONIA.

S. simulans, sp. nov. Sat late ovalis ; pubescens ; crebre punctulata ; nigro-picea ; prothoracis elytrorumque lateribus (his sat angustis) antennis pedibus et corpore subtus rufescentibus ; prothorace quam longiori plus duplo latiori, antrorsum fortiter angustatis, antice sat fortiter vix bisinuatim emarginato, angulis posticis rectis retrorsum leviter productis ; elytris sub-seriatim punctulatis, interstitiis alternis fulvo-pubescentibus. Long., $2\frac{3}{5}$ l. ; lat., $1\frac{3}{5}$ l. (vix).

Agrees with *Soronia* in all generic characters, I think,—elytra

almost entirely covering the pygidium, labrum well developed, emarginate, prothorax not overlapping the base of the elytra, prosternum not prolonged in a free process behind the anterior coxæ, tarsi simple, apex of mandibles bidentate.

Of the previously described Australian *Soroniæ*, I have not seen *S. superba*, Reitt., but from the description it is obvious that it is very different from this species—with conspicuous markings on the upper surface; *S. variegata*, Macl., is stated by Mr. Olliffe (from examination of the type) to be a *Neaspis*; *S. amphotiformis*, Reitt., is a very different insect, with very much wider lateral margins, markings on the elytra, &c., &c.

Compared with the European *S. punctatissima*, Ill., the present species (apart from colour and markings) is less elongate, with lateral margins much narrower, anterior angles of prothorax much less produced, surface of prothorax without inequalities, puncturation of upper surface much more distinct and subrugulose, seriate pubescence of elytra very conspicuous, puncturation of under surface much coarser, &c., &c.

The colour and markings are much like those of several Australian *Nitidulidæ* of other genera, *e.g.*, *Lasiodactylus marginatus*, Reitt.

Victoria; Alpine district.

LASIODACTYLUS.

L. marginatus, Reitt. (var. ? *obscurus*). Nigro-piceus vel piceo-rufescens; antennis (nonnullis exemplis clava picea) pedibus et corpore subtus rufis, nonnullis exemplis prothoracis lateribus dilutioribus; supra fortiter sat crebre punctulatus; prothorace quam longiori vix duplo latiori, antrorsum sat angustato, antice leviter emarginato, angulis posticis rotundato-obtusis; elytris subseriatim punctulatis, interstitiis alternis seriatim setulosis; tibiis anticis apice extus dente curvato productis. Long., $1\frac{4}{5}$ l.—$2\frac{1}{2}$ l.; lat., $\frac{4}{5}$ l.—$1\frac{2}{5}$ l.

I have not seen a typical example of *L. marginatus*, Reitt., but the specimens before me agree fairly well with the description, except in respect of colour. As I have seen a good many specimens, the variety seems to be deserving of a name, even if it be only a var.

I have described it sufficiently fully to characterise it as a species if it prove to be distinct from *L. marginatus*, as the description of the latter is wanting in detail—the puncturation, for instance, merely being called "close, and on the elytra irregularly seriate," without any indication whether it is fine or coarse. I do not know any familiar Australian *Nitidulid* with which the puncturation of the present form can be profitably compared. It is not unlike the prothoracic puncturation of *Macroura deceptor*,

Blackb., but this information will not be of much value to most Coleopterists; it is, however, in character very similar to the puncturation of the common European *Ips ferrugineus*, Fab., but is very much closer, the whole upper surface being quite as closely punctured as the *head* of *Ips ferrugineus*.

The "intermediate plate" on the under surface is moderately large, and is equilaterally triangular in shape.

Queensland.

IDÆTHINA.

The following species is so near absolute agreement with Herr Reitter's characters for this genus that I do not think it would be desirable to give it a new generic name merely on the ground of some slight discrepancies. These are that the mesosternum is (not "scarcely," but) *not* carinate, and that the prosternum is not prolonged behind the front coxæ in a distinct process. The structure of the prosternum is not mentioned in Herr Reitter's diagnosis of the genus, but from its being placed near *Æthina* and *Lasiodactylus* the presence may be inferred of at least the "small pin-point-like process" attributed to those two. This, however, I have not been able to detect in the example before me, the prosternum being bent down behind the anterior coxæ almost exactly as in *Soronia*. It is possible, however, that this may be the case in *Idæthina*, as otherwise it is difficult to understand why its author has separated it from *Lasiodactylus*, as all the characters given are also attributed to *Lasiodactylus*, except the labrum being very short, and this latter character seems a very feeble one on which to found a genus. The claws of *Idæthina* are said to be "simple;" the claws of the specimen before me are certainly not dentate, but they are slightly dilated at the base—not, however, to an extent that seems inconsistent with their being called simple. It is possible that Herr Reitter, if he saw this insect, would give it a new generic name. I may add that the eyes of this insect are more strongly and coarsely granulate than those of any other *Nitidulid* known to me. The piece of the undersurface which I have called the "intermediate plate" (*vide* p. 102) is very large and well defined, almost as in *Meligethes*.

I. cincta, sp. nov. Late subcylindrica; subnitida; sat longe fulvo-pubescens; rufus, prothoracis et elytrorum singulorum disco infuscato; prothoracis elytrorumque marginibus et tibiarum posteriorum 4 marginibus externis dense ciliatis; prothorace quam longiori fere duplo latiori, minus subtiliter sat crebre subrugulose punctulato, antrorsum fortiter angustato, antice emarginato, angulis posticis rectis, lateribus anguste marginatis; elytris postice singulatim late rotundatis pygidii dense pubescentis basin tegentibus, seriatim pube-

scentibus, leviter striatis, striis minus subtiliter punctulatis apicem versus vix profundioribus, interstitiis vix perspicue punctulatis; corpore subtus leviter sat crasse punctulato. Long., 2 l.; lat., 1 l.

Besides difference in colour, this species seems to differ from *I. Deyrollei*, Reitter, *inter alia*, by its striate elytra and more strongly punctulate prothorax.

S. Australia; taken by Mr. McDougall near Victor Harbour.

MACROURA.

Of this genus I have three species before me. One of them (from Western Australia and the Port Lincoln district of South Australia) is, I think, *M. brunnescens*, Reitt., the exact habitat of which has not, so far as I can ascertain, been previously recorded. It agrees with the description in every respect, except that the author does not mention the sutural angles of the elytra being rounded off so as to show a small piece of the propygidium. In his description of the Indian *M. meligethoides*, Herr Reitter mentions the presence of this character, and therefore his omission to mention it in describing *M. brunnescens* seems to imply its absence, but in all other respects the insect agrees so well with the description that I think the omission is probably accidental.

M. deceptor, sp. nov. Late ovalis; vix nitida; aureo-pubescens; piceo-nigra, labro ore antennis pedibus elytrorumque apice summo rufis; prothorace quam longiori duplo latiori, antrorsum sat angustato, antice leviter emarginato, fortiter sat crebre punctulato, angulis posticis rectis retrorsum sat productis; elytris apice singulatim rotundatis (propygidium in medio aperientibus), sat fortiter vix regulariter striatis, interstitiis ruguloso-punctulatis et seriatim minus perspicue aureo-pubescentibus; pygidio ruguloso. Long., $1\frac{3}{5}$ l.; lat., $\frac{4}{5}$ l.

Remarkably like a large *Meligethes;* the very strong and not very close puncturation of the prothorax, separately rounded (not truncate) apices of the elytra, the red apex of the elytra and the red antennæ will in combination distinguish this species from all its described congeners.

Northern Territory of South Australia.

M. Baileyi, sp. nov. Late ovalis; subnitida; aureo-pubescens; atra, antennarum basi pedibusque rufescentibus; prothorace quam longiori duplo latiori, antrorsum fortiter angustato, antice bisinuato, crebre sat fortiter punctulato, angulis posticis rectis retrorsum sat productis; elytris apice singulatim late rotundatis (propygidium in medio aperientibus), sat fortiter sat regulariter striatis, interstitiis rugulosis et seriatim aureo-pubescentibus; pygidio reguloso. Long., $1\frac{3}{5}$ l.; lat.

Resembles the preceding species, but differs in colour and in the evidently closer and less strong puncturation of the prothorax, which is about as strong as (and somewhat closer than) that of the prothorax of the European *Brachypterus urticæ*, Fab. Of the previously described species *M. brunnescens*, Reitt., and *nigra*, Reitt., are considerably larger, the former (as also *M. densita*, Reitt,) having the prothorax very much more finely punctured, and the latter—besides having the prothorax more finely punctured (as I should judge from the description)—having black pubescence and elytra truncate at the apex.

Queensland ; taken on Mount Bellenden-Ker by F. M. Bailey, Esq. (of botanical fame).

ÆTHINODES (gen. nov. *Nitidulidarum*).

Labrum transversum emarginatum ; antennarum clava magna fortiter compressa, articulis fortiter transversis ; oculi parvi fortiter prominentes fortiter granulati ; prothorax elytrorum basin haud tegens ; elytra pygidium fere totum tegentia ; prosternum pone coxas breviter productum et abrupte in apicem acutum retrorsum angustatum ; tarsi modice dilatati ; unguiculi basi dente obtuso armati ; corpus ovale pubescens ; mesosternum carinatum.

I cannot ascertain that any genus has been described hitherto to which an insect presenting the above characters could be referred without a likelihood of causing confusion, and therefore I am obliged to give a new name.

The piece of the undersurface which I have called the "intermediate plate" is very distinct ; it is narrow and elongate, much as in *Gaulodes*, and not unlike the corresponding piece in *Ips*. Other characters that seem likely to be generic are great elongation of the third joint of the antennæ, as compared with the following joints, and the disappearance of the third and fifth rows of pubescence on the elytra considerably before the apex.

I think the position of this genus will be near *Lasiodactylus* and *Æthina*, which have a very similar prosternal process—broad immediately behind the coxæ, and then narrowed to an apical angle very abruptly, so that the part behind the coxæ is triangular, and yet very short. I have not been able to examine the mandibles. The tarsi are dilated a little more strongly than in *Amphotis*. The eyes resemble those of the European *Cychramus luteus*, Kug., but are smaller, and even more prominent.

Æ. marmoratum, sp. nov. Late ovale, postice sat angustatum ; sat nitidum ; pubescens ; rufo-ferrugineum, prothorace elytrisque maculatim infuscatis ; prothorace quam longiori duplo latiori, minus subtiliter minus crebre punctulato,

antrorsum sat fortiter angustato, antice emarginato, angulis posticis acute rectis retrorsum subproductis, lateribus minus anguste reflexo-marginatis ; elytris postice singulatim rotundatis, fere ut prothorax punctulatis (sed puncturis subseriatim dispositis), seriatim pubescentibus, apicem versus seriebus 1^{a} 2^{a} 4^{a} que in carinis elevatis, 3^{a} 5^{a} que obsoletis. Long., $1\frac{4}{5}$ l. ; lat., 1 l.

Besides the apical part of the first, second, and fourth rows of pubescence, the parts of the sixth and seventh immediately behind the middle seem to be a little elevated.

In the example before me the infuscation on the disc of the prothorax is blotchy and very ill-defined, while that on the elytra is very distinct, consisting of a large common basal triangle and a number of small spots, the largest of which are on either side of the suture near the apex.

Tropical Australia ; I am not sure of the exact locality.

THALYCRODES (gen. nov. *Nitidulidarum*).

Labrum bilobum ; antennarum clava ut *Thalycræ ;* oculi sat magni sat prominentes modice granulati ; prothorax elytrorum basin haud tegens ; elytra pygidii partem tegentia ; prosternum ut *Lasiodactyli ;* mesosternum subtiliter carinatum ; tibiæ omnes extus dentibus spinulisque armatæ ; tarsi simplices ; unguiculi basi vix compresso-dilatati ; corpus pubescens, marginibus dense ciliatis.

The species for which I propose this name cannot be referred to *Thalycra*, on account of their having all their tibiæ strongly armed externally, the claws not truly simple, and the mesosternum traversed longitudinally by an extremely fine elevated line. I cannot help thinking that *Thalycra australis*, Germ., is congeneric with the species before me, and that its author overlooked the extremely fine carina on the mesosternum—indeed, I should have no hesitation whatever in considering one of the insects before me as identical with it specifically if it were not for this difficulty. I have therefore given it the name *australe*, as I am satisfied that, if generically, it is also specifically identical.

The "intermediate plate" on the undersurface of this genus is decidedly large, and forms a triangle. The third joint of the antennæ is, as in *Ethinodes*, longer than the next two together. Unfortunately, I have not been able to compare these species with a specimen of *Thalycra*, and have had to depend upon descriptions of that genus, aided by my memory of it, in making the preceding remarks.

T. australe (? Germ.). Ovale ; convexum ; sat nitidum ; pubescens ; ferrugineo-brunneum (elytris nonnullis exemplis obscure testaceo-maculatis); prothorace quam longiori duplo

latiori, minus subtiliter minus crebre punctulato, antrorsum sat fortiter angustato, antice emarginato, angulis posticis rotundatis lateribus anguste marginatis; elytris postice rotundato-truncatis, vix striatis, striis crebre punctulatis, interstitiis vix punctulatis alternis griseo-pilosis.

var. *tenebrosum;* corpore et antennarum clava nigrescentibus, elytris manifeste testaceo-maculatis. Long., $1\frac{1}{4}$—$1\frac{1}{2}$ l.; lat., $\frac{3}{5}$—$\frac{4}{5}$ l.

The front tibiæ have three blunt teeth placed round the apical external margin; the intermediate tibiæ have their external margin finely spined in its whole length, and there is a large bifid tooth a little before the apex, and a simple sharp one still nearer to the apex; the external margin of the hind tibiæ is finely spined in all its length, and bears close to its apex a long tooth which ends in two spines. The "intermediate plate" is in the form of an equilateral triangle, and is of large size.

The pale markings on the elytra consist of three or four large spots placed at intervals on either side of the suture in the anterior two-thirds of its length, and an additional spot on the base at the shoulder. In ordinary specimens they are scarcely, or not at all, noticeable; in the var. *tenebrosum*, they are very conspicuous.

S. Australia; near Adelaide, also near Port Lincoln.

T. pulchrum, sp. nov. Ovale; convexum; pubescens; ferrugineum, elytris notis infuscatis numerosis maculatis; prothorace quam longiori duplo latiori, minus subtiliter sat sparsim punctulato, antrorsum sat fortiter angustato, antice emarginato, angulis posticis bene determinatis obtusis, lateribus anguste marginatis; elytris postice rotundato-truncatis, leviter striatis, striis crebre punctulatis, interstitiis vix punctulatis alternis griseo-pilosis. Long., $1\frac{2}{5}$ l. (vix); lat., $\frac{3}{5}$ l.

The front tibiæ are strongly crenulate all along their external edge, and have two strong sharp teeth, one at the apex, the other immediately before it; the middle and hind tibiæ are feebly and widely serrate externally, and also bear a series of strong spines, their apex being dilated externally into a kind of blunt tooth, on which are several longer spines. The dark markings on the elytra are very distinct and very intricate. The suture is infuscate, a series of spots forms a kind of festoon from shoulder to shoulder, crossing the suture at about a-third of its length from the base, and on either side sends a branch forward to the base from the middle of its length between shoulder and suture, several spots placed transversely occupy the middle part of each elytron, and the apex is edged with dark-brown, which is continued on either side and then arched forward to the suture so as

to form a ring intersected by the dark suture on either side of which it thus encloses a patch of the pale ferruginous ground colour. The "intermediate plate" is in the form of an equilateral triangle, but is much smaller than in the preceding species.

S. Australia; near Port Lincoln.

T. cylindricum, sp. nov. Sat elongatum; subparallelum; subcylindricum; piceo-nigrum, capite prothoraceque obscure rufescentibus; antennis (clava excepta) pedibus et elytrorum maculis nonnullis rufis; prothorace quam longiori dimidio latiori, vix subcanaliculato, crebre minus subtiliter subaspere punctulato, antrorsum minus angustato, antice leviter emarginato, angulis posticis rotundato-obtusis, lateribus sat anguste marginatis; elytris postice rotundato-truncatis, leviter striatis, striis crebre punctulatis, interstitiis subrugulosis, alternis griseo-pilosis; oculis minus fortiter granulatis. Long., $1\frac{2}{5}$ l.; lat., $\frac{3}{5}$ l.

Although the subcylindric form and less strongly granulated eyes of this insect suggest considerable doubt as to whether it is rightly placed here, I cannot regard those characters as sufficient foundation for a new genus. The 3rd joint of the antennæ is a little less elongate than in the preceding two species, and on the under surface the "intermediate plate" is considerably narrowed and elongated; the other structural characters seem identical. The red blotches on the elytra are not very strongly defined (having somewhat the appearance of being marked on the inner surface of the elytra, and seen through its substance)—but I have no doubt their brightness is variable. They are very similar to those in some examples of *T. australe*.

The front tibiæ are very like those of *T. pulchrum*, but their crenulations are feebler and they have only a single blunt bifid tooth at the apex; the middle and hind tibiæ are spined externally, and have a bifid tooth close to the apex.

Victoria; in the Alpine district.

TROGOSITIDÆ.

NEASPIS.

N. pusilla, sp. nov. Elongato-ovalis; sat nitida; setulis albidis confuse vestita; picea, antennis basin versus prothoracis elytrorumque lateribus corpore subtus et pedibus plus minus rufescentibus; capite prothoraceque crebre obscure subrugulose punctulatis; hoc quam longiori plus duplo latiori, antrorsum leviter angustato antice leviter emarginato, angulis posticis subrectis retrorsum subproductis, lateribus late marginatis ciliatis subtiliter serratis; elytris sat crasse subrugu-

lose subseriatim punctulatis lateribus subtiliter ciliatis. Long., $1\frac{1}{2}$ l. ; lat., $\frac{3}{5}$ l. (vix).

Very like the common *N. variegata*, Macl., but *inter alia* without any pattern on the elytra, much smaller, more elongate, with the prothorax more transverse and less emarginate in front, with anterior angles scarcely at all produced, and having its lateral margins finely serrate.

South Australia ; near Adelaide.

PELTONYXA.

I have before me two species evidently belonging, I think, to this genus, but I cannot identify either of them with the previously recorded *P. Deyrollei*, Reitt., which is a much larger insect, besides differing in several other particulars.

P. australis, sp. nov. Elongata, postice leviter dilatata, minus convexa ; vix pubescens ; ferruginea, elytris dilutioribus, prothoracis disco utrinque (nonnullis exemplis) nigro-umbrato ; capite prothoraceque opacis confertim subtilissime punctulatis ; hoc quam longiori duplo latiori, antrorsum parum angustato, lateribus minus rotundatis minus late reflexis, angulis posticis rotundato-obtusis ; elytris fortiter seriatim punctulatis, interstitiis alternis vix elevatis. Long., $1\frac{2}{5}$ l. ; lat., $\frac{3}{5}$ l.

South Australia ; Adelaide district.

P. pubescens, sp. nov. Elongata, postice leviter dilatata, minus convexa ; pilis erectis sat elongatis vestita ; nigro-brunnea, antennis pedibus et prothoracis elytrorumque lateribus testaceis ; capite prothoraceque subtiliter rugulosis ; hoc quam longiori duplo latiori, antrorsum parum angustato, lateribus minus rotundatis sat anguste reflexis, angulis posticis rotundato-obtusis ; elytris fortiter rugulose subseriatim punctutulatis. Long., $1\frac{2}{5}$ l. ; lat., $\frac{3}{5}$ l.

Victoria ; under bark of Eucalyptus in the Alpine district.

COLYDIIDÆ.

The determination of the question whether a given insect should be referred to this family or to the *Tenebrionidæ* seems capable of depending merely on the existence or non-existence of a minute basal joint of the anterior four tarsi. *Byrsax*, for instance, was originally placed in the *Colydiidæ* as having tetramerous tarsi, and some years later its author, Mr. Pascoe, reported his having discovered it to be heteromerous, and so transferred it to the *Tenebrionidæ*. I draw attention to the close analogy (even if it be no more) between these families, because I have several new species before me for description, which I refer to the

Colydiidæ, but with a doubt whether they may not possess—as *Byrsax* is said to do—"a basal (tarsal) joint completely hidden in the cotyloid cavity of the tibia," which I have failed to discover.

DITOMA.

D. pulchra, Blackb. In the Alpine district of Victoria I have met with some examples of an insect which appear to be scarcely specifically distinct from this S. Australian species, although they are smaller and darker than the type. They vary a little in the prominence of the lateral dilatation of the prothorax, and I am not quite sure that they do not represent a distinct species, but I cannot find any invariable character by which to distinguish them. This insect bears a very remarkable general resemblance to *Sparactus interruptus*, Er.

D. torrida, sp. nov. Minus depressa; minus nitida; glabra; ferruginea; capite postice prothoracis disco et elytrorum maculis numerosis (his fascias 4 irregulares formantibus) obscure fuscis; prothorace granulato, utrinque bicostato et inter costas internas basin versus carinis 2 arcuatis instructis, costis et marginibus lateralibus (his late reflexis) subtiliter crenulatis, angulis omnibus acutis; elytris singulis carinis 5 valde elevatis instructis, interstitiis crasse biseriatim punctulatis. Long., $2\frac{1}{2}$ l. (vix); lat., $\frac{4}{5}$ l.

This species must be near *D. serricollis*, Pasc.; in that species, however, *inter alia*, the upper surface appears to be of a uniform dark-brown colour—the prothorax to be simply bicostate on either side instead of having a short arched additional costa looped on to each of the inner costæ near the base—and the head to be trilobed in front, whereas the head of the present species is rotundate-truncate in front, very much as that of the European *D. crenata*.

N. Queensland; in the collection of C. French, Esq.

D. nivicola, sp. nov. Minus depressa; subnitida; setis suberectis minus crebre vestita; brunneo-nigra; antennis, capite antice, prothoracis lateribus, elytrorum maculis parvis nonnullis (his testaceo-pubescentibus) et pedibus, rufis; capite prothoraceque crebre granulosis; hoc minus inæquali, lateribus fortiter serratis a basi antrorsum gradatim magis fortiter dilatatis antice valde productis; elytris striatis crasse subseriatim rugulose punctulatis. Long., $1\frac{3}{5}$ l.; lat., $\frac{3}{5}$ l. (vix).

The colours and markings of this species are much like those of *D. hilaris*, Blackb., but the latter is a considerably narrower and more elongate insect, with the prothorax much less dilated laterally, the elytra less coarsely sculptured, &c.

Victoria; Alpine district, under the bark of a *Eucalyptus* standing in a snowdrift.

SARROTRIUM.

S. australe, sp. nov. Elongatum; nigrum; antennis squamis griseo-ferrugineis vestitis, pedibus ferrugineis, elytris fasciis 2 rufis ornatis; capite utrinque pone oculos spina armato; prothorace antrorsum angustato, angulis anticis lateraliter subspinosis; elytris profunde punctulato-striatis, longitudinaliter 3-costatis, costis externis pone medium sinuatis. Long., 2 l.; lat., $\frac{3}{5}$ l. (vix).

Several genera of *Tenebrionidæ (e.g., Elascus)* have been described, the remarkable similarity of which to *Colydiid* genera has been remarked on. I at first supposed this present species to pertain to one of them, but on careful examination I find that it does not; with the aid of a compound microscope I feel sure that it is not heteromerous; it can be so only if there is a very minute basal joint of the anterior tarsi so imbedded in the cotyloid cavity of the tibia as to be discoverable only by dissection, which I have not been able to employ, having only a single example. The fasciæ on its elytra are of a bright red colour; one of them commences a little behind the shoulder on the margin and runs obliquely to the suture a little in front of the middle, the other being subapical and straight. The short lateral spine into which the antennal orbit is drawn out behind the eye is a very distinctive character. The head and prothorax are extremely like those of *Sarrotrium clavicorne*, and the antennæ are almost exactly like the antennæ of that species, though a little less stout.

It may be remarked that the specimen before me is in its structural characters extremely like the figure of *Latometus pubescens*, Er. (Wiegm. Arch., 1842, I., tab. 5, fig. 3); it is, however, evidently much narrower and more elongate, and moreover the figure represents *Latometus* as having all the five joints of the anterior four tarsi quite well defined.

Victoria; in the Alpine district.

MERYX.

M. æqualis, sp. nov. Elongata; parallela; supra æqualis; subnitida; subreticulatim albido-pubescens; capite prothoraceque confertim subtiliter punctulatis; hoc postice minus angustato, lateribus crenulatis; elytris sat fortiter vix seriatim punctulatis, vix manifeste 3-costatis; antennarum articulis ultimis 2 quam 9^{us} nonnihil brevioribus; palporum maxillarum articulo ultimo apice oblique truncato. Long., $3\frac{1}{5}$—4 l.; lat., 1—$1\frac{2}{5}$ l.

The whitish pubescence is very inconspicuous on the prothorax; on the elytra it is very distinct, but not very sharply limited; it forms a reticulated pattern somewhat like the reticulation formed in the previously described species by costæ. Compared with

M. illota, Pasc., the present species is less opaque, its prothorax is less narrowed behind, and its antennæ are longer, more slender, and less incrassate towards the apex, with the apical two joints distinctly though not much shorter than the preceding joints; the last joint of the maxillary palpi is a little more sharply triangular than in *M. illota*.

South Australia; near Port Lincoln, under bark.

SPARACTUS.

This genus is remarkably like *Ditoma* superficially, but may be at once distinguished by the 3-jointed club of its antennæ. A species occurring not uncommonly in S. Australia and Victoria agrees very well with the description of *S. interruptus*, Er., the only species named up to the present time. The following seem to be new:—

S. pustulosus, sp. nov. Opacus; niger, antennis pedibus prothoracis lateribus elytrorum basi et corpore subtus obscure rufescentibus; supra granulatus; capite angulos 4, prothorace processus serratos 3, utrinque formantibus; horum antico permagno antrorsum curvato-producto; prothorace supra tuberculis conicis instructo; elytris 3-seriatim tuberculatis. Long., 2 l.; lat., $\frac{4}{5}$ l.

S. Australia; common under bark of Eucalyptus in various localities.

S. elongatus, sp. nov. Opacus; niger, antennis pedibus capite antice prothoracis lateribus et corpore subtus rufescentibus; supra granulatus; capite quadrato, antice rotundato-truncato, lateribus reflexis; prothorace antice fortiter bisinuato, lateribus leviter sinuatis late reflexis crenulatis, disco tuberculis parvis nonnullis instructo; elytris obscure 3-seriatim tuberculatis. Long., $2\frac{1}{3}$ l.; lat., 1 l. (vix).

S. Australia; Port Lincoln district.

S. proximus, sp. nov. Opacus; niger, capite antice antennis pedibusque rufescentibus; supra granulatus; capite fere ut *S. interrupti*, Er., sed angulis subanticis rotundatis; prothorace inæquali, antice dilatato, margine crenulato; elytris 3-costatis, costis interioribus interruptis. Long., $1\frac{2}{5}$ l.; lat., $\frac{3}{5}$ l. (vix).

Very like *S. interruptus*, Er., but differently coloured and sculptured, the upper surface (except the reddish front of the head) being unicolorous; the inner two costæ on each elytron being less frequently, and less widely, interrupted (so that they appear much less like a series of tubercles); and the hinder of the two angles of the sides of the head being quite rounded off. In both these species the upper surface of the head is flattish and

more or less quadrate, but very close to its front margin is suddenly contracted into an extremely short parallel-sided prolongation; in both, the sides and front of this terminal piece meet in sharp angles, and in *S. interruptus* there is also a well-defined angle at the point where the head is contracted, while in *S. proximus* this part is rounded off.

S. Australia; near Adelaide.

S. costatus, sp. nov. Opacus; niger, pedibus plus minus piceis, antennis tarsis et corpore subtus obscure rufescentibus; supra granulatus; capite prothoraceque fere ut *S. interrupti*; elytris 3-costatis, costis haud interruptis. Long., $1\frac{1}{5}$—$1\frac{3}{5}$ l.; lat., $\frac{2}{5}$—$\frac{3}{5}$ l.

S. Australia; widely distributed, and not rare.

The following is a tabulation of the described species of *Sparactus*:—

A.	Elytra with all their costæ entire ...	costatus, Blackb.
AA.	The inner two costæ interrupted.	
	B. The subapical angles of the head rounded...	proximus, Blackb.
	BB. The subapical angles of the head well defined	interruptus, Er.
AAA.	All the costæ broken up into tubercles.	
	B. Prothorax simply sinuate in lateral outline	elongatus, Blackb.
	BB. Lateral margin of prothorax cut into large and conspicuous processes	pustulosus, Blackb.

BOTHRIDERES.

B. Victoriensis, sp. nov. Nitidus; prothorace fortiter punctulato, disco late depresso, medio vix elevato; niger; antennis pedibusque piceo-rufis, elytris fulvo-castaneis; his striatis, interstitiis subconvexis obscure punctulatis inter se æqualibus. Long., 2 l.; lat., $\frac{3}{5}$ l.

Very like the common *B. vittatus*, Newm. Compared with it, the head does not differ noticeably—the prothorax is a little more elongate (being quite as long as wide) with the discal impression less marked—the elytra have not the sutural dark stripe, and their interstices are very different (the second being as wide as the first and third, and all of them being slightly convex). I do not think this species can be identical with *B. musivus*, Pasc., which, however, it, perhaps, somewhat approaches; its colour seems to be very different, and also I cannot find any elytral sculpture agreeing with that attributed to *B. musivus*, which is said to have "three lateral alternate interstices costæform."

Victoria; Alpine district.

B. merus, Pasc. This species is not very intelligibly described. In the author's tabulation of the genus it is placed as "subopaque," but in the description it is called "subnitid." It is further distinguished from *B. musivus* by several characters, and it is added, "in both the elytra are less deeply striated," suggesting the enquiry, "less deeply than what?" Perhaps words may have been omitted by a printer's error.

I have before me a species which occurs not uncommonly under bark of *Eucalyptus* in the Alpine district of Victoria, which, I think, is probably *B. merus*; it is a trifle less nitid than is usual in the genus, and seems to agree with Mr. Pascoe's description, such as it is. The longitudinal convexity down the centre of the depressed space on the prothorax is, however, a little better defined than the description would lead one to expect. It is remarkable for its very small narrow head, a character not referred to by the author of *B. merus*. It has the third elytral interstice much narrower than either the second or fourth, a character which at once distinguishes it from *B. Victoriensis*. Of the other species having prothoracic sculpture of similar character, *musivus*, Pasc., seems to be larger, and to have "three lateral alternate interstices costæform" (*sic*); *costatus*, Blackb., has elytra very differently sculptured; *vittatus*, Newm., has a much wider head, different colours, &c.

CUCUJIDÆ.

SILVANUS.

S. armatulus, sp. nov. Minus elongatus; sat convexus; pubescens; ferrugineus; prothorace quam longiori vix latiori, crebre subtiliter rugulose punctulato, supra æquali, lateribus fortiter 6-dentatis; elytris punctulato-striatis. Long., 1 l.; lat., $\frac{3}{10}$ l.

Not unlike *S. advena*, Kunz, in outline and convexity, but with the prothorax more elongate, narrower (especially behind), and armed at the sides with six strong teeth.

Victoria; Alpine district.

S. monticola, sp. nov. Sat elongatus; sat convexus; pubescens; ferrugineus; capite prothoraceque obscuris; hoc quam longiori haud latiori, confertim subtiliter vix rugulose punctulato, supra æquali, lateribus subrectis subtiliter sat crebre denticulatis, ad angulos anticos dente majori instructis; elytris punctulato-striatis. Long., 1 l.; lat., $\frac{3}{10}$ l. (vix).

Very like the preceding species, but narrower and more elongate, with the sides of the prothorax very differently sculptured.

Victoria; under bark of *Eucalyptus* in the Alpine district.

CRYPTOPHAGIDÆ.

CRYPTOPHAGUS.

C. Lindensis, sp. nov. Oblongo-ovalis; sat convexus; ferrugineus; pube fulva minus brevi vestitus; prothorace transverso, confertim sat fortiter rugulose fere confluenter punctulato, supra æquali (nihilominus trans basin depresso), lateribus ante medium leviter rotundato-dilatato; antennarum clava 3-articulata, articulis minus fortiter transversis. Long., 1 l. (vix); lat., $\frac{3}{10}$ l.

This little species seems to be a true *Cryptophagus*, and I cannot identify it with any described species, though it is, I think, rather close to *C. pubescens*, Sturm., but *inter alia* it has no trace whatever of the angular dilatation which that species presents in the middle of the lateral margin of its prothorax.

Compared with *C. affinis*, Sturm. (the only species of the genus previously recorded as found in Australia), the present insect is considerably smaller and narrower; its puncturation is markedly closer on the prothorax, and a little less close on the elytra; the sides of its prothorax are straight and parallel from the base to beyond the middle, their front part having the lateral strongly margined dilatation so characteristic of *Cryptophagus*, but this is not quite so strong as in *C. affinis;* the antennæ are not quite so stout as in *C. affinis*, and their club is different, its joints being about equal in width, the first and third only slightly transverse, the second shorter than the other two, and moderately strongly transverse, but much less strongly so than either the first or second in *C. affinis*.

S. Australia; Port Lincoln district, under bark of *Casuarina*.

ATOMARIA.

Although I cannot find that any Australian species of this genus have been described, the genus is well represented in Australia. The following are among the species in my collection :—

A. australis, sp. nov. Ovalis; convexa; pubescens; sat fortiter sat crebre æqualiter punctulata; subtus nigra, supra ferruginea; elytris pone medium nigro-fasciatis, antennis pedibus que rufescentibus; prothorace transverso subquadrato, basi haud marginato, ante basin utrinque fovea profunda rotundata impresso; antennis basi sat distantibus. Long., 1 l.; lat., $\frac{2}{5}$ l.

South Australia; widely distributed.

A. Lindensis, sp. nov. Oblonga, sat convexa; pubescens; rufo-ferruginea, capite prothoraceque piceis; minus fortiter punctulata; prothorace elytris sat angustiori, subquadrato, basi haud marginato, ante basin utrinque fovea obsoleta rotundata

impresso, minus crebre punctulato ; elytris sat crebre pnnctulatis ; antennis basi sat distantibus. Long,, 1 l. ; lat., $\frac{3}{10}$ l.

Var. capite prothoraceque ferrugineis.

This species is very like the European *A. badia*, Er., from which it differs in its antennæ less approximate at their base, the prothorax not so much narrower than the base of the elytra, and the puncturation of the elytra considerably closer and finer.

South Australia ; Port Lincoln district ; among fallen leaves.

LATHRIDIIDÆ.

CORTICARIA.

C. australis, sp. nov. Oblonga ; convexa ; sat nitida ; sat dense (in elytris lineatim) pubescens ; fusco-brunnea ; antennis (clava excepta) pedibusque dilutioribus ; capite prothorace parum angustiori ; oculis magnis prominulis; prothorace leviter transverso, crebre sat fortiter (æque ut caput) punctulato, ante basin sat profunde arcuatim impresso, impressione in medio leviter foveata, angulis posticis rotundato-obtusis ; elytris quam prothorax vix fere duplo latioribus, vix striatis, puncturarum sat magnarum seriebus crebris instructis, his apicem versus vix obsoletioribus. Long., $\frac{4}{5}$ l. ; lat., $\frac{3}{10}$ l.

Very like the European *C. gibbosa*, Herbst., differing chiefly by the presence of a well-defined round fovea in the middle of the transverse sulcus on the prothorax, and by the closer rows of punctures on the elytra, which are not placed in distinct striæ, and between which the interstices are perfectly flat throughout.

S. Australia and Victoria.

C. Adelaidæ, sp. nov. Oblongo-elongata ; sat nitida ; sat dense (in elytris lineatim) pubescens ; testaceo-brunnea ; antennarum clava picea ; capite prothorace sat angustiori ; oculis sat magnis sat prominulis ; prothorace sat fortiter transverso, crebre subtilius punctulato, ante basin fovea rotunda instructo, angulis posticis bene determinatis, elytris quam prothorax sat latioribus, subtiliter striatis, striis crebre subtiliter punctulatis, sculptura apicem versus vix obsoletiori. Long., $\frac{4}{5}$ l. ; lat., $\frac{3}{10}$ l.

Resembles the European *C. elongata*, Gyll., differing chiefly in the piceous club of its antennæ, its more strongly punctulate prothorax, the perfectly flat interstices of its elytra, and its somewhat less parallel form.

S. Australia ; widely distributed.

C. Lindensis, sp. nov. Breviter ovalis ; sat nitida ; sat dense (in elytris lineatim) pubescens ; rufo-testacea ; antennis apicem versus obscurioribus; capite quam prothorax parum angus-

tiori ; oculis sat magnis sat prominulis ; prothorace fortiter transverso, crebre fortius subrugulose punctulato, ante basin sat profunde arcuatim impresso, impressione in medio foveata, angulis posticis obtusis ; elytris prothorace fere duplo latioribus, striatis, striis puncturis sat magnis instructis, apicem versus vix obsoletis. Long., $\frac{7}{10}$ l. ; lat., $\frac{3}{10}$ l.

This species is of the short broad form of *C. curta*, Woll., which it resembles also in respect of sculpture, differing, however, in the strongly marked transverse furrow of its prothorax ; its sculpture is much stronger and coarser than those of the two species described above.

S. Australia ; Port Lincoln district.

C. Andersoni, sp. nov. Oblongo-elongata ; sat nitida ; sat dense (in elytris lineatim) pubescens ; supra testaceo-brunnea, subtus piceo ferruginea ; capite prothorace parum angustiori, oculis sat magnis sat prominulis ; prothorace leviter transverso, minus crebre profunde nec subtiliter punctulato, ante basin transversim arcuatim sulcato, angulis posticis rotundatis ; elytris prothorace duplo latioribus, subtilissime striatis, striis subtiliter punctulatis, sculptura apicem versus vix obsoletiori ; antennis pedibusque testaceis, illarum clava vix infuscata. Long., $\frac{3}{5}$ l. ; lat., $\frac{3}{10}$ l. (vix).

This minute *Corticaria* differs from all the preceding in having a very strongly marked transverse sulcus on the hind part of the prothorax, without any round fovea. The puncturation of the prothorax is also distinctive—rather coarse, but not deep, nor very close.

S. Australia ; Port Lincoln district. Named after my friend, Mr. J. Anderson, of Port Lincoln.

C. alutacea, sp. nov. Nigro-picea, antennarum basi pedibusque paullo dilutioribus ; lineari-elongata ; subdepressa ; fere glabra ; alutacea ; capite prothoraceque parce punctulatis, hoc basin versus angustato, ante basin fovea magna profunda impresso, angulis posticis obtusis bene determinatis, lateribus minute nec crebre denticulatis ; elytris pygidio haud plane tegentibus, subtilissime seriatim punctulatis, antennarum clavæ articulis brevibus. Long., $\frac{1}{2}$ l. ; lat., $\frac{1}{5}$ l. (vix).

This species must be extremely close to *C. subtilissima*, Reitt., but appears to differ from it in having the hind angles of the prothorax very well defined, and the joints of the antennal club different, the basal two being quite strongly transverse, and the apical one elongate-globose—all three of equal width *inter se*. The fine denticulation of the sides of the prothorax is scarcely noticeable without the use of a compound microscope.

S. Australia ; in several localities.

MYCETOPHAGIDÆ.

TRIPHYLLUS.

T. intricatus, sp. nov. Subovalis, postice angustatus; pubescens; rufo-ferrugineus; elytris 3-fasciatim nigro-notatis; prothorace fortiter transverso, antrorsum fortiter angustato, confuse dupliciter punctulato, postice utrinque impresso, angulis posticis sat acutis; elytris leviter striatis, striis sat fortiter punctulatis, interstitiis vix convexis leviter nec crebre nec subtiliter punctulatis. Long., $1\frac{3}{5}$ l.; lat., $\frac{4}{5}$ l. (vix).

The dark markings on the elytra are intricate and a little variable. They consist of three zig-zag fasciæ, which do not usually reach the lateral margins (the intermediate fascia does so in some examples), the hinder two, or even all three, being indistinctly connected with each other at their lateral extremities in some examples. One of these fasciæ is basal, and is often reduced to a mere blotch on each side the scutellum; the next is median; the last is ante-apical, but in many specimens is dilated hindward so as nearly to reach the apex itself.

Victoria; a few specimens occurred in fungi on a mountain called Baldi, at an elevation of about 6,000 feet.

MYCETÆA.

M. pilosella, sp. nov. Breviter ovalis; subnitida; pilis erectis sat sparsim vestita; ferruginea; prothorace crebre rugulose minus subtiliter punctulato, intra marginem lateralem vix manifeste costato; elytris minus crebre minus fortiter punctulatis; antennis sat elongatis; metasterno minus brevi. Long., $\frac{7}{10}$ l.; lat., $\frac{3}{10}$ l.

This minute species is extremely like the European *M. hirta*, Marsh., superficially. It is a little more elongate and (perhaps consequently) its metasternum is not quite so short; its antennæ are a little longer; the lateral costæ of the prothorax are almost obsolete; the hind coxæ are not quite so widely separated; the puncturation of its prothorax is closer, and that of its elytra is both finer and closer. At a casual glance, it might pass for a small form of *M. hirta*.

S. Australia; in fungi near Port Lincoln.

DIPLOCŒLUS.

D. angustulus, sp. nov. Angustus; parallelus; ferrugineus; pilis erectis vestitus; prothorace transverso, retrorsum leviter angustato, sparsim sat fortiter punctulato, utrinque intra marginem leviter bicostato; elytris punctulato-striatis, puncturis subquadratis sat grossis; abdominis segmento basali in medio oblique bistriato; antennarum clavæ articulo 1° quam 2^us^ multo angustiori. Long., 1 l.; lat., $\frac{3}{10}$ l. (vix).

The elongate parallel form of this little species gives it an appearance very different from that of the European *D. fagi*, Guér., but I cannot find any structural characters to prevent its being placed in the same genus; at any rate, the identity of tarsal and antennal characters, the lateral sculpture of the prothorax, and the oblique striæ of the basal ventral segment diverging hindward from the middle of the front margin are points of resemblance that indicate at least very close affinity between the two insects. The two previously described Australian *Diplocœli* (*ovatus*, Macl., and *piliger*, Reitter), seem to be similar in form to the European species. Herr Reitter says that he has not seen a description of Sir W. Macleay's species, but judges it distinct from his because the name *ovatus* would be unsuitable to the latter. On comparing the descriptions, I should deem it possible that they are identical. In both descriptions the elytra are said to be "strongly punctulate striate," and this character (apart from the shape of the body) will furnish a further distinction from the present insect, in which the elytra are very feebly striate, although the punctures in the striæ are fairly large and strong.

S. Australia; under bark of *Eucalyptus* in various localities.

D. exiguus, sp. nov. Minus angustus; minus parallelus; pubescens; ferrugineus; prothorace postice vix angustato, sparsim sat fortiter punctulato, utrinque intra marginem sat fortiter bicostato; elytris vix striatis, striis puncturis sat magnis subquadratis instructis, his apicem versus obsoletescentibus; abdominis segmento basali in medio oblique bistriato; antennarum clavæ articulo 1° quam 2^us^ paullo angustiori. Long., 1 l.; lat., $\frac{2}{5}$ l. (vix).

This species is not at all unlike *D. fagi*, Guér., in miniature; it differs from the preceding *(D. angustulus)* in its wider and less parallel form, and especially in the ninth antennal joint being (as in *D. fagi)* only moderately narrower than the tenth. *D. piliger*, Reitt. *(? ovatus*, Macl.)—the other described Australian species—is said to have the prothorax closely punctured, the elytra differently coloured, &c.

South Australia; near Port Lincoln.

DERMESTIDÆ.

TROGODERMA.

Two Australian species have been described as members of this genus—*T. riguum*, Er. (from Tasmania), and *T. apicipenne*, Reitter (from "Australia"). The former I am fairly sure that I have not seen, the latter I think I have taken on several occasions. As, however, I am a little doubtful about my identification being correct, it will be wiser not to refer further to Herr Reit-

ter's species beyond saying that the insect which I take to be it is very distinct from all the following, which appear to be new :—

T. Eyrense, sp. nov. Ovale (feminis subparallelis); obscure nigro- et fulvo-hirtum ; nigrum, antennarum articulis 2-6 tibiis tarsis et elytrorum lateribus apiceque plus minus rufescentibus ; obscure sat crebre punctulatum ; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Mas. Antennarum clava 5-articulata, quam articuli 1-6 conjuncti multo longiori ; horum articulis 2-5 minutis æqualibus, 6° quam 5^{us} paullo longiori et sat latiori ; clava cylindrica, hujus articulo 1° quam sequentes multo breviori, 2°-4° sat æqualibus, 5° acuminato quam 3^{us} 4^{us} que conjuncti vix breviori ; antennis quam prothorax vix brevioribus.

Femina. Antennis paullo brevioribus ; clava quam stipes vix longiori, illius articulo ultimo quam præcedens paullo longiori. Long., $1\frac{2}{5}$—$1\frac{4}{5}$ l. ; lat., $\frac{4}{5}$ l.—1 l.

It should be noted that the sixth joint of the antennæ is so intermediate in width between the fifth and seventh that it might almost as well be classed with the club (making it six-jointed) as with the stipes. I have reckoned it as belonging to the latter because its *length* is perhaps more harmonious with that association. There is not any *very great* difference between the antennæ of the male and those of the female ; in the latter, however, the club being evidently shorter than in the former, and especially the last joint being shorter as compared with the preceding joints. The pilosity of the upper surface is fairly dense and consists of black and greyish or fulvous hairs intermingled.

South Australia ; basin of Lake Eyre.

T. alpicola, sp. nov. Ovale ; obscure nigro- et griseo-hirtum ; nigrum, antennarum articulis 2-6 (vel 3-6) tarsis et elytrorum apice rufis ; obscure minus crebre punctulatum ; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Femina (?). Antennarum clava 5-articulata, quam articuli 1-6 conjuncti haud longiori, articulis 3-6 parvis æqualibus, clava ovali, hujus articulis 1-3 ex ordine latioribus, 4° 3° æquali, 5° quam 4^{us} paullo longiori sat angustiori ; antennis quam prothorax sat brevioribus. Long., $1\frac{3}{5}$ l. ; lat., $\frac{4}{5}$ l.

Although I think the specimens before me are females, I have no hesitation in describing this species, since the differences between the male and female are but slight in all the species known to me that are closely allied to the present one, consisting chiefly in the females being larger than the males, and having the apical joint of the antennæ—or the whole club of the antennæ—some-

what shorter. Apart from the antennal difference, this insect is extremely close to the preceding, and I do not see much other distinction save in the puncturation being less close, and the tibiæ almost as obscure in colour as the femora.

Victoria ; Alpine district.

T. Adelaidæ, sp. nov. Ovale, subelongatum ; obscure nigro- et griseo-hirtum ; nigrum, antennarum articulis 3-7 tarsisque rufis ; sat crebre subaspere punctulatum ; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Antennis fere ut *T. Eyrensis* sed maris articulo 6° feminæ articulis 6° 7° que minoribus. Long., $1\frac{1}{5}$—$1\frac{1}{4}$ l. ; lat., $\frac{3}{5}$ l.

This species is much like *T. Eyrense* in its antennal structure, but owing to the joints immediately preceding the club (and the first joint of the club itself) being smaller, the club has no appearance of being six jointed in the male, and in the female might almost be regarded as only four jointed, and in both sexes is not quite so cyclindric in form. The uniform black or pitchy black colouring (except the tarsi and the middle of the antennæ) will at once separate this insect from the preceding two, and its close subasperate puncturation (not less close and subasperate on the prothorax than on the elytra) will furnish a further distinction.

South Australia ; Adelaide district, &c.

T. Lindense, sp. nov. Late ovale ; fulvo-hirtum ; piceo-nigrum ; antennis pedibusque (femoribus vix infuscatis) testaceis, elytris testaceo-brunneis ; capite prothoraceque subtiliter (hoc latera versus crassius), elytris obscure vix crebre punctulatis ; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Mas. (?). Antennarum clava 5-articulata, quam articuli 1-6 conjuncti vix longiori articulis 3-6 parvis æqualibus, clava ovali hujus articulis 1° et 2° parvis fere cum stipite numerandis, 3° et 4° sat magnis inter se sat æqualibus, 5° quam 4^{us} paullo longiori vix angustiori. Long., 1 l. ; lat., $\frac{3}{5}$ l. (vix).

I believe I have both sexes before me, and that the difference between them is very slight ; in one example the apical joint of the antennæ is certainly shorter and more rounded at the apex than in the other. The seventh and eighth joints of the antennæ are very much smaller than the following three, so that the club might almost be regarded as tri-articulate only ; but on careful examination I think those two joints really belong to the club, being different in form from the preceding four.

The entirely testaceous antennæ will *inter alia* distinguish this little species from all the preceding.

South Australia ; near Port Lincoln.

T. difficile, sp. nov. Elongato-ovale ; obscure nigro- et griseo-hirtum ; nigrum, antennarum articulis 3-7 tarsisque rufis ; obscure subcrasse (prothoracis disco multo minus crasse) punctulatum ; sulcis antennariis minus profundis, postice clausis, lateribus subparallelis.

Mas. (?) Antennarum clava 4-articulata, quam articuli 1-7 conjuncti haud longiori, articulis 3-7 parvis, clava ovali, hujus articulo 1° parvo, 2° et 3° sat æqualibus, 5° quam 4^us^ multo longiori haud angustiori. Long., $1\frac{2}{5}$ l. ; lat., $\frac{7}{10}$ l.

The prosternal sulci in this species differ in form from those of the preceding ; they are a little wider and less deep, and instead of the sides of each sulcus converging from its open base (on the front margin of the prosternum) continuously till they meet at the hind angle of the prosternum, they run almost parallel to each other for about half their length, and converge only in their hind portion.

The 3rd and following joints of the antennæ are very closely crowded together, and consequently difficult to count ; it is only by examination under a high-power that I have satisfied myself as to their number. As in some of the preceding species, the apportionment of joints to the stem and club is no easy matter. At a glance, the club seems to be 3-articulate, but on examination the 8th joint seems clearly to go with those of the club, being evidently much wider than the preceding—but I cannot look upon the 7th joint as a part of the club. The robust apical joint (not at all narrower than the penultimate) gives the antennæ a very distinct appearance. The puncturation of the elytra also is coarser than usual.

S. Australia ; near Port Lincoln.

T. Macleayi, sp. nov. Late ovale, postice angustatum ; nigro-hirtum ; nigrum, antennis tarsis et elytris (macula magna communi discoidali nigra excepta) rufis ; obscure vix crebre (prothoracis disco magis subtiliter sat sparsim) punctulatum ; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Mas. Antennarum articulis 4-10 pectiniformibus, 3° minuto, 11° compresso-lamelliformi.

Femina. Antennarum articulis 5-10 leviter serratis, 11° ovali apice acuminato. Long., $1\frac{1}{5}$—$1\frac{4}{5}$ l. ; lat., $\frac{4}{5}$ l.—1 l.

The pectinations of the antennæ of the male increase in length to the seventh joint, those of the seventh, eighth, and ninth being about equal *inter se*, each of them about as long as the basal four joints together of the front tarsi, that of the tenth joint is a little shorter. The apical joint is a compressed somewhat piriform lamella scarcely so long as the tenth joint.

South Australia and Victoria ; on flowers.

T. occidentale, sp. nov. Ovale ; nigro-hirtum ; piceum, antennis tibiis tarsisque testaceis, elytris rufo-brunneis ; crebre subaspere punctulatum ; sulcis antennariis sat profundis bene determinatis, triangularibus, postice clausis ; elytris abbreviatis.

Femina (?). Antennarum clava elongato-ovali 6-articulata, quam articuli 1-5 conjuncti multo longiori, articulis (apicali quam 10^{us} paullo angustiori paullo longiori excepto) ex ordine latioribus.

The third, fourth, and fifth joints of the antennæ are small, and equal or nearly so *inter se ;* the club quite distinctly consists of six joints. I am doubtful of the sex of my unique example, but it is probable that the comparative shortness of the apical joint of the antennæ points to its being a female. The elytra are abbreviated, and separately rounded behind, as in *Thaumaglossa ;* the other characters are of *Trogoderma.*

West Australia ; taken by E. Meyrick, Esq.

T. Baldiense, sp. nov. Elongato-ovale, subparallelum ; obscure griseo- et nigro-hirtum ; nigrum, antennis tarsisque testaceis, elytris apicem versus macula magna sanguinea utrinque ornatis ; obscure vix crebre (prothoracis disco magis subtiliter magis sparsim) punctulatum ; sulcis antennariis sat profundis bene determinatis, triangularibus, postice clausis.

Feminæ antennarum articulis 6-10 leviter serratis, 11° ovali apice acuminato. Long., 2 l. ; lat., $1\frac{1}{5}$ l.

This species is evidently a near ally of the preceding. My unique example is a female ; its antennæ scarcely differ from those of the same sex in *T. Macleayi*, but the slight internal production of the fifth joint which is distinct in the latter is here not traceable. I have no doubt the antennæ of the male are very like those of *T. Macleayi* (male). The large bright red spot near the apex of each elytron is a very distinctive character.

Victorian Alps ; crawling on snow on a mountain called Baldi.

T. Yorkense, sp. nov. Ovale ; obscure nigro- et griseo-hirtum ; nigrum, antennis tibiis tarsisque testaceis, elytris rufo-brunneis ; crebre (prothoracis disco obscure sparsim) punctulatum ; sulcis antennariis latis leviter impressis, parallelis, postice apertis.

Maris (?) antennarum clava 4-articulata quam articula 1-7 conjuncti subbreviori, ovali, articulo (clavæ) 1° quam sequentes multo breviori et angustiori, 2° et 3° inter se sat æqualibus, 5° vix angustiori, quam 3^{us} 4^{us} que conjuncti vix breviori. Long., $1\frac{4}{5}$ l. ; lat., 1 l.

The distinction between club and stem in the elytra is very indeterminate, and some dilatation is discernible in the seventh

joint; it might be possible therefore to regard the club as five-jointed, but at a casual glance it would pass for being only three-jointed, as the eighth joint is very much narrower and shorter than the ninth. Although this species has altogether the general facies of *T. Eyrense*, *alpicola*, and their allies, it is very widely distinct from them by the entirely different shape of the prosternal sulci, which are shallow (though perfectly well defined), much wider than the reception of the antennæ requires, parallel-sided or nearly so, and open behind.

S. Australia; Yorke's Peninsula.

T. Meyricki, sp. nov. Ovale; nigro- et albido-hirtum; nigrum, antennarum basi tibiis tarsisque rufo-testaceis, elytris vix rufescentibus; obscure sat crebre punctulatum; sulcis antennariis latis minus fortiter impressis, antice parallelis postice vix manifeste clausis.

Maris antennarum clava 7-articulata, quam articuli 1-4 conjuncti plus duplo longiori, articulis 1-5 ex ordine latioribus, 6° 5° æquali, ultimo quam 5^{us} sat longiori vix angustiori.

Feminæ antennarum clava 5-articulata, quam articuli 1-6 conjuncti vix longiori articulis 1-3 ex ordine latioribus, 4° 3° æquali, 5° 4° latitudine et longitudine æquali, apice rotundato, Long., $1\frac{1}{5}$ l.; lat., $\frac{3}{5}$ l.

The different number of joints in the antennal club of the male and female is unusual, but I think the two specimens before me are certainly the sexes of one species.

W. Australia; taken by E. Meyrick, Esq.

T. antipodum, sp. nov. Elongato-ovale, sat parallelum; nigro-hirtum; nigrum, tarsis rufis, elytrorum apice vix rufescenti; subtiliter sat sparsim punctulatum; sulcis antennariis subobsoletis, latis, obliquis, postice apertis.

Maris antennarum clava 7-articulata, quam articulati, 1-4 conjuncti duplo longiori, sat cylindrica, articulo 1° quam sequentes sat angustiori, ultimo acuminato quam 10^{us} sat longiori. Long., $1\frac{1}{5}$ l.; lat., $\frac{1}{2}$ l.

The third and fourth joints of the antennæ are very minute, and form a slender connection between the basal two joints (which are robust, as in the rest of the species described above) and the cylindric club. The prosternal sulci are very wide and feeble, being not very noticeable, until in a certain light one sees an oblique track running along them and marking the position of the antennæ in repose.

S. Australia; near Adelaide.

T. singulare, sp. nov. Elongato-ovale, sat parallelum; nigro- et griseo-hirtum; fuscopiceum, elytris dilutioribus, antennis tibiis tarsisque testaceis; subtiliter sparsim punctulatum;

sulcis antennariis subobsoletis, latis, obliquis, postice apertis. Maris antennarum clava 7-articulata quam articuli 1-4 conjuncti plus duplo longiori, cylindrica, articulis 1° et 2° quam sequentes sat angustioribus, ultimo leviter acuminato quam 10^{us} sat longiori. Long., 1 l.; lat., $\frac{1}{2}$ l. (vix).

The third and fourth joints of the antennæ are so minute that they are not very easily observed, and at a glance the antennæ seem to have only nine joints.

This species is very near the preceding, but differs from it (apart from the very different colouring) in the decidedly less stout antennæ and the extreme minuteness of the third and fourth joints of the same. My unique example is considerably abraded, but I can trace indications of the grey pubescence on the elytra, forming two fasciæ, which might perhaps be more distinct in a very fresh specimen.

S. Australia; near Port Lincoln.

The following is a tabulation of the species described above:—

A. Elytra covering (or nearly so) the hind body.
  B. Prosternal sulci sharply defined, triangular, very deep, and strongly closed behind.
    C. Antennæ testaceous or rufous, unicolorous.
      D. Tibiæ testaceous, elytra unicolorous, antennæ simply clubbed... ... ... Lindense.
      DD. Tibiæ piceous, elytra red, with a large common basal black blotch, antennæ pectinated or serrate ... ... Macleayi.
      DDD. Tibiæ black, elytra black, each with a large subapical red spot, antennæ serrate (female, probably pectinate in male) ... ... Baldiense.
    CC. Antennæ with at least the club black, or nearly so.
      D. Elytra black, their apex rufous.
        E. Club of antennæ cylindric in both sexes... ... ... Eyrense.
        EE. Club of antennæ oval (at least in the female)... ... ... alpicola.
      DD. Elytra entirely black ... ... Adelaidæ.
  BB. Prosternal sulci more feeble, not (or scarcely) closed behind.
    C. Species of oval (non parallel) form, antennal club having less than 7 joints.
      D. Antennæ having at least the club black difficile.
      DD. Antennæ entirely rufous ... ... Yorkense.
    CC. Species of oval form, antennal club of male 7-jointed ... ... Meyricki.

CCC. Species of parallel form, antennal club of male having 7 joints.
D. Antennæ entirely rufous ... ... singulare.
DD. Antennæ having at least the club black antipodum.
AA. Elytra strongly abbreviated ... ... occidentale

ADELAIDIA, *gen. nov.*

Trogodermati affinis sed antennarum clava sat laxe 3-articulata; elytris abbreviatis singulatim rotundatis, propygidio in medio aperto; unguiculis appendiculatis; sulcis antennariis vix perspicuis.

This genus is also near *Thaumaglossa*, which, however, has 10-jointed antennæ, and distinct prosternal sulci for the reception of the antennæ in repose. The antennal club of the species before me consists of joints, none of which are distinctly transverse, the first and third being quite as long as wide, the second scarcely wider than long. *Trogoderma riguum*, Er., must be superficially very like this species—so much so in fact, that I have thought it best to adopt the same specific name.

A. rigua, sp. nov. Late ovalis; pilis erectis nigris et adpressis albis vestita; nigra, antennis pedibusque rufis, prothorace ad latera et utrinque ad basin albo-pubescenti, elytris fasciis tenuibus 4 et macula apicali parva albopubescentibus ornatis (fasciis 1ª basali 2ª antemediana, 3ª postmediana, 4ª subapicali); crebre subtiliter subaspere punctulata.

Feminæ (?) antennarum articulis 1° 2° que sat magnis, 2-7 parvis inter se subæqualibus, clava 3-articulata oblonga quam articuli ceteri conjuncti multo breviori, illius articulis 1° 3° que inter se longitudine æqualibus 2° his breviori. Long., 2 l. (vix); lat., 1 l.

S. Australia.

CRYPTORHOPALUM.

C. Australicum, sp. nov. Late ovale; pilis crebris (his nigris in partibus nigris, rufis in partibus rufis) vestitum; nigrum, subtus vix rufescens, antennis tibiis tarsisque rufis, elytris fascia antemediana et macula apicali rufis ornatis; obscure sat crebre (prothoracis disco vix perspicue) punctulatum. Long., 1—1½ l.; lat., ⅗—⅘ l.

S. Australia; near Port Lincoln.

C. Woodvillense, sp. nov. Ovale; pilis crebris (his nigris in partibus nigris, testaceis in partibus dilutioribus) vestitum; nigrum vel piceo-nigrum, antennis tibiis tarsisque testaceis, elytris fasciis 2 et apice rufo-testaceis; crebre sat crasse sat aspere (prothoracis disco vix perspicue) punctulatum. Long., 1 l.; lat., ½ l.

The sides of the prothorax bear some scattered whitish hairs. The anterior fascia of the elytra is slightly in front of the middle, and is rather wide and much zigzagged; the hinder fascia is a little narrower and less flexuous, and scarcely reaches the suture. In some specimens there is a faint reddish spot on either side of the scutellum.

The above two species appear to differ from those described by Herr Reitter in having conspicuous red or testaceous fasciæ and markings on the elytra, as well as in the pattern being different. In the species of Herr Reitter the markings appear to be caused by differently coloured pubescence on a unicolorous ground; in two of them these markings consist of *three* fasciæ, besides basal and apical spots, while in the other they consist of basal spots and a single median fascia.

The present species differs from *C. Australicum* not only in the pattern on its elytra but in its smaller size and much coarser sculpture.

S. Australia; Woodville.

C. interioris, sp. nov. Ovale, lateribus parum rotundatis; pilis crebris (his in elytris nigris in partibus nigris albis in partibus dilutioribus, in prothorace albis) vestitum; piceo-nigrum, antennis pedibusque testaceis, femoribus vix infuscatis, elytris maculis magnis testaceis nonnullis ornatis; sat crebre sat subtiliter subaspere punctulatum; antennarum clava minus dilatata, articulis 2 mox pone clavam vix a clava distinctis. Long., 1—1$\frac{2}{5}$ l.; lat., $\frac{1}{2}$—$\frac{7}{10}$ l.

The comparatively small size of the antennal club and the increase in width of the eighth and ninth joints, making them appear almost as belonging to the club, are perhaps a little inconsistent with this genus, but the club is in other respects quite normal, and all the other characters are as in typical *Cryptorhopalum*. Joints 3-9 of the antennæ are extremely short, 8 and 9 scarcely longer, though evidently wider than the preceding joints; 10 is as long as the preceding three together, and much wider; 11 is very much longer and wider than 10, and is rounded.

The pattern on the upper surface is very intricate. The prothorax is much clothed with longish white hairs. Each elytron bears five large testaceous spots, of which one is close to the scutellum, one behind the shoulder, one near the suture in front of its middle (this and the spot behind the shoulder are in some examples obscurely joined into a fascia), one a little in front of the apex on the disc, and 1 *at* the apex (the apical two are in some examples obscurely joined into a vitta). The white hairs on the elytra are not strictly limited to the testaceous parts, but seem to form an independent pattern in three ill-defined fasciæ

(basal, median and subapical), and are also sprinkled over the apex.

S. Australia; basin of Lake Eyre.

ANTHRENUS.

A. Museorum, Fab. This species is recorded as Australian in Mr. Masters' Catalogue. I have not seen an Australian example of it.

A. varius, Fab. Far too plentiful in S. Australian collections; also on flowers. It is not mentioned in Mr. Masters' Catalogue.

A. australis, Hope. I have taken in various localities, on flowers, an *Anthrenus* which agrees fairly well with the very brief description of this insect. The only discrepancy is that the elytra are (not black but) dark brown, becoming paler towards the apex; one example has *very* dark brown elytra, which might almost be called blackish, and it may perhaps vary to black. It has the three wavy fascia of white pilosity as described. It has abdominal sulci for the reception of the hind legs, and eleven-jointed antennæ with a three-jointed club.

A. ocellifer, sp. nov. Ovalis, lateribus parum rotundatis; confertissime squamis nigris fulvis et albis vestitus, supra squamis fulvis et albis submaculatim dispersis his in illis mediis positis, subtus squamis albis superficiem totam (nisi abdominis latera et apicem fulvo-squamosa) tegentibus; niger, pedibus rufis; crebre sat subtiliter punctulatus; antennis 11-articulatis, clava 3-articulata; pedibus in sulcis receptis. Long., $1\frac{1}{5}$—$1\frac{1}{2}$ l.; lat., $\frac{3}{5}$—$\frac{4}{5}$ l.

The black fulvous and white scales are on the prothorax mixed confusedly; on the elytra they take the form of fulvous spots on a black ground, the middle part of the fulvous spots being white; there are seven or eight spots on each elytron. I do not know any other *Anthrenus* presenting the following characters in combination:—Antennæ eleven-jointed, with a three-jointed club, all the legs received in sulci, antennæ entirely black, legs entirely red, ventral segments without any black spots; body densely scaly.

S. Australia; on flowers.

A. Flindersi, sp. nov. Ovalis; obscure nigro- et griseo-hirtus; niger, antennis totis tibiis tarsisque rufis, elytris apice rufescentibus; crebre sat subtiliter (prothoracis disco minus crebre magis subtiliter) punctulatus; sulcis antennariis valde profundis, fere transversim positis, externe subrotundatis; segmento ventrali basali utrinque transversim sulcato.

Maris (?) antennarum clava 3 articulata, articulis 1-8 conjunctis longitudine æquali, articulis 3-8 perbrevibus (7° et 8° paullo latioribus); clava cylindrica, hujus articulo 2° quam

ceteri sat minori, articulo apicali apice rotundato-angustato. Long., $1\frac{1}{5}$ l.; lat., $\frac{3}{5}$ l.

Feminæ (? hujus speciei) antennarum articulo apicali quam 9^{us} sat breviori (elytris fasciis albopilosis 2 instructis, altera basali altera antemediana, his secundum suturam conjunctis). Long., $1\frac{4}{5}$ l.; lat., 1 l.

The prosternal sulci of this insect are very deep, run obliquely (or almost transversely) across the front portion of the prosternum, their extremity being on the lateral margin considerably in front of the hind angles of the prosternum, and are rounded at their extremity (as in *A. Musæorum*).

I hesitate to refer the female described above to this species, on account of its very much greater size, the somewhat conspicuous fasciæ on its elytra, and the less clearly testaceous colour of its antennal club. The male example described above is, however, certainly abraded, and may have had the elytral fasciæ when fresh. It may be distinguished from the species I take for *A. australis*, Hope, apart from colour, by the much larger club of its antennæ.

S. Australia; near Port Lincoln, the male on flowers of *Hakea*.

BYRRHIDÆ.

BYRRHUS.

The following species is evidently congeneric with that which I described in Trans. Roy. Soc., XII., p. 138, as *B. Torrensensis*, although the tarsi are still less contractile. I drew attention (loc. cit.) to the feebleness of the tibial channels in that species. In the present insect the tarsi do not appear to be laid back in repose altogether *against* the tibiæ, but to be so placed that their base is in a groove at the apex of the tibiæ, and their apical joints are free. This character is inconsistent with *Byrrhus*.

B. raucus, sp. nov. Subglobosus; nitidus; subfortiter (prothorace crebre, elytris minus crebre) punctulatus; pilis nigris erectis perlongis crebre vestitus; supra æneus subcuprascens, antennis tarsisque rufescentibus; subtus niger, crebre fortiter rugulose punctulatus. Long., $1\frac{2}{5}$ l.; lat., 1 l.

Very like *B. Torrensensis*, but more globose, clothed with longer hair, differently coloured, the prothorax more strongly punctured, the underside black or nearly so, and much more strongly and roughly punctulate.

Victoria; in the Alpine district.

HETEROCERIDÆ.

HETEROCERUS.

H. Victoriæ, sp. nov. Elongato-oblongus; sat nitidus; griseo-pubescens; piceo-niger, prothoracis lateribus elytrorum notis

numerosis tibiis intus tarsis et mandibulis rufis ; prothoracis angulis posterioribus marginatis ; elytris creberrime minus subtiliter sat aspere punctulatis, sat perspicue striatis. Long., 2 l. ; lat., $\frac{3}{5}$ l.

The markings on the elytra are well defined and intricate ; they consist of an irregular red lateral border scarcely reaching the base or apex ; from this a branch runs off behind the shoulder towards the suture, which on the middle of the disc turns upward and reaches the base, along which it runs a short distance towards the scutellum, and then turns down again, running somewhat parallel to (and close beside) the suture to about a third the length of the elytron ; the red lateral margin gives off another branch behind its middle, which runs obliquely forward almost to the hind extremity of the front branch, and is in the form of two triangles having their apices directed hindward and their bases in a continuous line ; between this hind branch and the apex there is an elongate red spot.

This species is extremely like the European *H. marginatus*, Fab. Compared with that insect it is a little narrower and less robust, with prothorax scarcely so strongly punctulate and elytra very evidently striate. The puncturation of the elytra is scarcely different. The prothorax is a little more narrowed both in front and behind, and has more strongly rounded sides, but is scarcely less transverse.

Compared with *H. Flindersi*, Blackb., this insect has much more closely punctulate elytra, while from *H. Australasiæ*, Waterh., and *H. multimaculatus*, Blackb., it differs *inter alia* in not having the elytra perceptibly narrowed behind the shoulders.

Victoria ; Alpine district.

H. indistinctus, sp. nov. Elongato-oblongus ; minus nitidus ; griseo-pubescens ; piceo-niger, prothoracis lateribus elytrorum notis numerosis tibiis intus tarsis femoribus et mandibulis pallide testaceis ; prothoracis angulis posterioribus marginatis ; elytris vix perspicue striatis, crebre sat subtiliter vix aspere punctulatis. Long., 2—$2\frac{1}{5}$ l. ; lat., $\frac{7}{10}$—1 l.

This species is undoubtedly very close to the preceding, but I cannot regard it as a mere variety.

The markings on the elytra, from some points of view, are entirely concealed by the pubescence ; they are as follows on each elytron :—A marginal band widely continued to both base and apex, which is dilated in a kind of blotch scarcely in front of the middle, and again immediately behind the middle ; two elongate spots almost side by side on the disc a little in front of the middle ; a spot of variable form (bifid in some examples) on the disc just behind the middle (in some examples this spot is connected with

the external of the two anterior spots, and in some with the hinder dilatation of the pale margin); an elongate subapical spot.

The present insect differs from *H. Victoriæ* in colour, the lighter parts being pale yellow instead of rufous, and the femora being testaceous instead of blackish, also in its non-striate elytra (in most examples they are non-striate, in some there is a scarcely perceptible indication of striæ) and in the distinctly finer, less rugulose, and less close puncturation of the elytra; the spines on the anterior tibiæ are more numerous, being nine or ten, while in *H. Victoriæ* they number only seven or eight. Compared with *H. Flindersi* the elytra are considerably more closely punctured; and the elytra not (or scarcely) narrowed behind the shoulders will separate it from *H. Australasiæ* and *H. multimaculatus*. In some specimens (probably males) the prothorax is less transverse than in others.

Victoria; on the banks of the river Ovens.

H. Flindersi, Blackb. The puncturation of the elytra in this species is scarcely distinguishable from that in the European *H. femoralis*, Kiesenw.

LAMELLICORNES

ATÆNIUS.

A. speculator, sp. nov. Minus angustus; minus parallelus; minus nitidus; setis erectis pallidis brevissimis vestitus; niger, clypei margine prothoracis margine antico palpis antennis pedibusque rufescentibus; capite subtilius densissime punctulato (puncturis in rugis longitudinalibus confusis), clypeo antice sat fortiter rotundato-emarginato; prothorace crebre ruguloso-punctuato, fortiter transverso, angulis posticis plane rotundatis; elytris striatis, interstitiis convexis obscure asperato-granulatis. Long., 2 l. (vix); lat., $\frac{4}{5}$ l.

Differs from *A. australis*, Har., by its less narrow, less parallel form, its pale setæ, scarcely costiform elytral interstices, prothorax much more narrowed hindward, and with scarcely any trace of a dorsal sulcus, &c., &c. The species described by Sir W. Macleay as *Ammœcii* are stated by the Baron de Harold to be (at least some of them) *Atœnii*. They are from N. Queensland and N. W. Australia. None of them are described as being clothed with pale setæ. *A. granulator*, Har. from New Guinea, appears to be very near the present species, but to be somewhat larger, the clypeus subtruncate, &c.

In this species the humeral spine is small, but very well-marked, and more directed outward than in *A. australis*, Har.

Victorian Alps.

A. Palmerstoni, sp. nov. Minus angustatus; minus parallelus; minus nitidus; ater, pedibus piceis (anticis rufescentibus),

antennis testaceis; capite subtilius creberrime punctulato, clypeo antice rotundato-emarginato; prothorace fortiter sat crebre subrugulose punctulato, fortiter transverso, lateribus sat parallelis, angulis posticis dentatis; elytris late sulcatis, sulcis intus seriatim granulatis, interstitiis anguste costatis, humeris fortiter spiniformibus. Long., $2\frac{1}{2}$ l.; lat., 1 l.

The hind angles of the prothorax are very peculiar, being strongly dentiform; behind the tooth-like projection the sides run evenly round hindward, so that the hind part of the prothorax is in the form of a distinct wide lobe.

N. Territory of S. Australia.

ANOPLOGNATHUS AUREUS, *Waterh.*

From the "Zoological Record" for 1889, received a few weeks ago, I learn that this species was described in the "Ann. and Mag. of N. Hist." for Oct., 1889. It must be very like (as regards size, colour, &c.) my *Calloodes Frenchi*, described in a paper read before the Linnæan Society of N.S. Wales in March, 1890; but I think the statement in describing *A. aureus* that its elytra have "only one or two lines of punctures at the sides," and that their "margins are not reflexed in the middle," is conclusive as to the two being distinct. As remarked in a previous paper of this series, I cannot regard *Calloodes* as really distinct from *Anoplognathus*, although the name is convenient if it be regarded as that of a subgenus founded on merely superficial characters.

BUPRESTIDÆ.

CHALCOPHORA.

C. Frenchi, sp. nov. Splendide viridis, cyaneo-micans; capite longitudinaliter excavato et in medio carinato (carina antrior sum furcata); prothorace fortiter subcrebre vermiculatm-ruguloso, utrinque basi longitudinaliter impresso, linea dorsali irregulari elevata; elytris costatis fere ut *C. superbæ*, Saund. (sed costa suturali fere recta, submarginali plane ad apicem producta), apice subtruncatis, margine laterali postice denticulato, apice suturali spiniformi; corpore subtus crasse ruguloso; antennis obscure cyaneis, articulis basalibus 2 viridibus. Long., 22 l.; lat., 8 l.

A magnificent species of brilliantly metallic colour, varying from green to cyaneous or purple, according to the light in which it is looked at. It is nearly allied to *superba*, Saund., from which it differs (apart from colour) as follows:—The prothorax is much more closely and evenly vermiculate (almost exactly as in *gigas*, Hope), and has a very distinct longitudinal impression running forward from the base a little nearer to the lateral margin than to the middle on either side (I do not know any other Australian

species of *Chalcophora* in which this character is so well marked); the elytra are very much less narrowed off at the apex, and their costæ are a little differently arranged, that next the suture being parallel to the suture (in *superba* the same costa is very strongly curved a little before the apex), and that nearest the lateral margin being continued quite to the apex; the costæ, moreover, are subobsolete near the base. On the undersurface the sculpture is very much coarser, the vermiculate smooth elevations occupying a much larger proportion of the area as compared with the depressed closely punctured spaces; the prosternum is concave longitudinally between the coxæ (in *superba* it is convex), and the basal ventral segment (the specimens before me seem to be of the same sex, probably female), is much more narrowly concave down the middle, the apical ventral segment being narrowly sinuate-truncate at the apex (it is not much different in same sex of *superba*, but in the unique example before me is slightly chipped, and therefore I cannot be quite certain). The concavity of the prosternum will, I think, distinguish this species from all its near allies (*i.e.*, *gigas*, Hope, *Waterhousei*, Masters, and *superba*, Saund.); its colour also is completely distinctive, and from *Waterhousei* it may be known by its prothorax and elytra nonpubescent.

N. Queensland; in the collection of C. French, Esq.

STIGMODERA.

S. tibialis, Waterh. Mr. Tepper, of the S. Australian Museum, has lately shown me a very fine series of this insect, which has lately been placed in the Museum by Mr. C. F. Johnson, M.P. They were taken in W. Australia (near York), where, I do not think, there has been any record of the species occurring. *S. tibialis* is evidently extremely variable, as I find the elytra of some specimens entirely yellowish red, of others entirely dark red, and of others dark red, with two or more more or less defined paler fasciæ. In some examples the ventral segments are more or less spotted with yellowish. Among all these varieties I do not find any approximation to *S. Stevensi*, Gehin, in respect of the colouring of the sides of the prothorax, but the acuteness of the angulation on the intermediate tibiæ (which is said to be a distinguishing character) is very variable in degree, and I am afraid an examination of the specimens before me suggests inevitable doubt as to the validity of Mr. Waterhouse's species.

S. princeps, sp. nov. Femina. Sat late oblonga, minus convexa; nigra, vix ænea, prothorace plus minus piceo-rufescenti, elytrorum lateribus (parte antica excepta) anguste (et apice late) sanguineo-marginatis; capite vix concavo, minus fortiter sat crebre (ut *S. parvicollis*) punctulato; prothorace

trans basin quam longiori vix dimidio (postice quam antice duplo) latiori, crasse confuse (indisco sat sparsim, quam *S. parvicollis* multo minus crebre) punctulato, margine antico bisinuato postico in medio (ut *S. parvicollis*) lobato, lateribus a basi ad medium fere parallelis ; elytris (fere ut *S. parvicollis*) valde striatis, interstitiis convexis subtiliter sat sparsim punctulatis, apicibus simplicibus ; sternis in medio sparsissime sat fortiter, latera versus sat crebre acervatim (prosterno crassissime rugulose) punctulatis ; abdomine nitidissimo fere lævigato, segmentis basali apicalique et ceterorum partibus lateralibus puncturis raris instructis. Long., 20—24 l. ; lat., $7\frac{1}{2}$—$8\frac{1}{2}$ l.

The general appearance (in respect of colour and markings) is suggestive of *S. grandis*, Don., but the prothorax is more or less reddish and without a pale margin, the elytral pale margin begins more or less behind the base and is confined in front to the narrow edging outside the outermost stria (the next interstice being included from the middle or thereabouts), and the apex (about the apical one-fifth or one-sixth part of the whole elytra) is sanguineous).

In all other respects this species is extremely close to *S. parvicollis*, Saund., from which it scarcely differs otherwise, except as follows :—It is much larger and distinctly wider, the prothorax is evidently larger in proportion to the other parts (its anterior narrowing commencing evidently further from the base) and is much less closely sculptured ; on the undersurface (in the same sex) the sides of the metasternum and the ventral segments are much less closely sculptured.

In all probability, the male differs from the female as in *parvicollis*, having the undersurface much more closely sculptured, and the apical ventral segment much shorter and subtruncate.

W. Australia ; taken by J. C. F. Johnson, Esq.

S. rectipennis, sp. nov. Sat angusta, sat parallela ; nigra, vix cyanea, elytrorum lateribus anguste (et apice late) sanguineo-marginatis, prothorace (in angulis posticis) et abdomine nonnullis exemplis sanguineo-notatis ; capite longitudinaliter late concavo minus fortiter sat crebre (ut præcedentis) punctulato ; prothorace trans basin quam longiori dimidio (postice quam antice fere duplo) latiori, confuse sat rugulose sat crebre (disco postice nec crebre rugulose) punctulato, margine antico bisinuato postico in medio late sat fortiter lobato, lateribus a basi fere ad medium subparallelis ; elytris post humeros vix sinuatis, valde striatis, interstitiis vix perspicue punctulatis, (6° toto 7° 8° que antice confusis rugulosis), apicibus late leviter emarginatis, biacutis ; corpore subtus sat hirsuto, sat fortiter sat crebre subæqualiter

(prosterno metasterno et in femina segmento 1° basali in medio sparsius subtilius, prosterni lateribus crassius) punctulato.

Maris segmento ventrali apicali late leviter emarginato, feminæ truncato. Long., 15 l.; lat., 5½—6 l.

This species is distinguishable from all others known to me of the genus by the elytra being scarcely sinuate behind the shoulders; in *S. macularia*, Don., the elytral sinuation is slight, but in the present insect it is less marked still. I have seen two males and two females; both the former have the apical ventral segment bright red, and one of them has the penultimate red and the antepenultimate spotted with red, while the other has merely the penultimate spotted with red; of the females one has the hind body entirely black while the other has the apical segment spotted. The female with the hind body entirely black has the prothorax also entirely black, in the other three examples before me at least the hinder part of the lateral margin of the prothorax is red.

W. Australia; taken by J. C. F. Johnson, Esq.

S. imperator, Thoms. There can be no doubt, I think, that this is another name for *S. Murrayi*, Gemm. and Har., which was substituted in 1869 for *S. trifasciata*, Murr., a preoccupied name. Thomson's name was published in 1878, and therefore becomes a synonym.

TENEBRIONIDÆ.

CÆDIOMORPHA.

C. australis, Blackb. In describing this species (Trans. Roy. Soc. S.A., 1887, p. 272) I accidentally omitted to state the size; it is, long., 2 l.; lat., 1⅗ l.

LINDIA.

L. angustata, Blackb. In describing this species (Trans. Roy. Soc. S.A., 1887, p. 275) I accidentally omitted to state the size; it is, long., 2 l.; lat., ½ l.

PLATYDEMA.

P. obscurum, Blackb. (Proc. L.S., N.S.W., 1888, p. 1,430). Mr. G. C. Champion—a well-known English authority on the *Tenebrionidæ*—has kindly drawn my attention to the fact that this was a pre-occupied name; I therefore propose *T. Championi* as a substitute.

PHYTOPHAGA.

Prasonotus morbillosus, Chap. This name having been preoccupied by Mr. Baly, I propose *Chapuisi* as a substitute.

CRYPTOCEPHALUS.

C. consors, Boisd. I have recently seen an example of this

species sent to me by Mr. Olliffe for inspection, in which the yellow elytral margin is absent. This agrees with Boisduval's description. Suffrian (Mon. XIII., p. 103) seems to think that the yellow margin was accidentally overlooked by Boisduval, and redescribes the insect as having it. In all other respects the example I am referring to seems to agree with specimens having the yellow border.

EDUSA.

This genus was originally formed by M. Chevrolat, and published in M. Dejean's Catalogue (1837), but M. Lefèvre in 1885 proposed to substitute *Edusia*, on the ground that *Edusa* was a nom. præocc, having been used by Albers in 1860 for a genus of *Mollusca*. It is difficult to understand the reason of this proposal, especially as *Edusa* was recognised and in use in the *Coleoptera* before 1860 by others than its author, M. Bohemann, for example, having used it in 1858 for species that M. Lefèvre now calls *Edusia*. The species attributed to the genus differ considerably *inter se* in respect of facies and structure, in consequence of which Dr. Chapuis in 1874 (Gen. Col., vol. X.) proposed to adopt three names—*Edusa*, *Edusina*, and *Edusella*—as marking three subgenera of *Edusa*. I do not think that this subdivision can be maintained, at any rate unless a number of other subgenera be added; I have a large number of species before me, not half of which will fit exactly into any of those Dr. Chapuis characterised. I shall therefore not attempt to apportion any of the new forms among subgenera beyond remarking that the first six evidently would fall into the subgenus *Edusa*, and that *E. œnea* and *minor* might probably fall in *Edusina*. *E. suturalis*, Chap., is the only species I have seen that agrees with the description of *Edusella*. The "Groupe *Edusites*" of Chapuis is characterised among the *Eumolpidæ* by the following in combination:—Prosternal episterna convex in front, elytra transversely wrinkled. In this group, *Edusa* was the only Australian genus known to Dr. Chapuis, and he separated it from those of other countries primarily by its being pubescent. The Rev. H. Clark had, however, characterised two other genera—*Thaumastomerus* and *Ocnus*—from N.W. Australia, but in such terms that Dr. Chapuis could not satisfy himself even as to the "groupe" in which they should be placed; he could see no reason, however, to say that they might not be merely somewhat aberrant species of *Edusa*. It should not be overlooked, nevertheless, that Dr. Baly has since appeared to recognise *Ocnus* as a good genus, having attributed to it a new species from N.W. Australia. I have not seen any *Edusites* from N.W. Australia, or any species that seems to me likely to belong to either of the Rev. H. Clark's genera if they are distinct from *Edusa*. In 1885 M. Lefèvre formed a new genus of

Edusites under the name *Cleptor*, which, however, does not seem to differ from *Edusa* by any very striking character. Apparently, *Cleptor* has the eyes entire (instead of "obsoletely sinuate within"), the antennæ shorter, with the apex thickened; the body glabrous, the prosternum transverse, the femora unarmed, and the tibiæ longitudinally sulcate; these are all the points of difference I can discover. I have not seen any species in which all of them are to be found, but one or more characterise a good many species which I cannot separate from *Edusa*, and I think they are all discoverable in some or other of the series in my collection. In 1889 I formed a new genus of *Edusites* under the name *Edusoides*, distinguished by its tibiæ being produced laterally at the apex into an elongate horizontal process in both sexes; I have seen no other species presenting any indication of this character.

My conclusion therefore is that I am unable to find any well-marked and constant character (except in the case of *Edusoides*) by which to break up *Edusa* even into subgenera, and I accordingly apply that name to all the Australian *Eumolpidæ* known to me possessing the following characters in combination:—Prosternal episterna convex in front, elytra transversely wrinkled at the sides, tibiæ not externally prolonged at the apex into a horizontal process. The following characters in addition are present in all the species known to me:—Tibiæ not emarginate externally near the apex, anterior femora very rarely altogether simple, the basal joint of at least the anterior tarsi dilated in the male, claws divaricate and appendiculate, the sexes differing *inter se* in the structure of the basal ventral segment. I may add that I think a better anatomist than myself might probably discover generic differences that I have not observed.

The following is a tabulation of the new species described below, together with such others of the *Edusæ* as I have identified. I do not think that I have seen any of the species from N.W. Australia which the Rev. H. Clark described, and the absence from his descriptions of reference to structural characters renders it impracticable to place those species (without having seen them) in a tabulation. A similar remark would apply to the species described by Germar and Bohemann as having the anterior femora unarmed; I have not seen any of these three, and the descriptions do not state whether the femora are angulate or rounded beneath. There remain unknown to me besides the above *E. puberula*, Bohem., from Sydney (which seems to be near my *E. bella*, but to have the clypeus entirely testaceous, and the antennæ shorter), and *E. viridicollis*, Lef. (which appears to be a large species with dense pubescence, and the posterior tibiæ of the male incurved at the apex, characters I have not seen in combination).

It should perhaps be added that the antennæ are usually slender filiform, and not very much shorter than the body. As they appear to vary a little in length sexually, I have not found them very useful for specific characters, and have not made special mention of them in my descriptions, except in a few cases where their structure is exceptional.

A. Upper surface more or less pubescent or setiferous.
  B. The elytral vestiture consists of setæ or fascicles of setæ about the sides and apex.
    C. Front angles of prothorax (at least fairly) well defined.
      D. The elytral setæ forming fascicles.
        E. The femora testaceous.
          F. The prothorax very closely and roughly punctulate ... varipes, Boisd.
          FF. The prothorax not closely or roughly punctulate distincta, Blackb.
        EE. The femora entirely blackish spinicollis, Blackb.
      DD. The elytral setæ not forming fascicles.
        E. The prothorax not very closely punctured nor much wrinkled transversely.
          F. The scutellum punctured and scarcely nitid.
            G. Hind tibiæ of male strongly incurved at the apex ... varians, Blackb.
            GG. Hind tibiæ of male simple minor, Blackb.
          FF. Scutellum nitid lævigate ... Froggatti, Blackb.
        EE. Prothorax very closely punctured and much wrinkled transversely ... ... chrysura, Germ.
    CC. Front angles of prothorax quite rounded off ... ... diversicollis, Black.
  BB. The elytral vestiture evenly distributed, and in general much finer.
    C. Upper surface more or less metallic.
      D. Anterior femora simply rounded beneath ... ... inermis, Blackb.
      DD. Anterior femora widely angulate, but not with a distinct tooth.
        E. Elytra set with erect hairs ... pavens, Blackb.
        EE. Elytra with adpressed pubescence only ... ... Meyricki, Blackb.
      DDD. Anterior femora with a well-defined tooth.

E. Elytra with well-defined vittæ of whitish pubescence; prothorax and elytra unicolourous otherwise.
F. Femora testaceous ... ... lineata, Blackb.
FF. Femora blackish ... ... ænea, Blackb.
EE. Species not marked and coloured as "E."
F. Hind femora rounded beneath.
G. Elytra set with longish erect hairs.
H. Prothorax nearly twice as wide as long ... pilifera, Blackb.
HH. Prothorax much less than twice as wide as long ... ... fraterna, Blackb.
GG. Elytra devoid of longish erect hairs.
H. Upper surface entirely green.
I. Puncturation extremely fine, and not asperate ... ... glauca, Blackb.
II. Puncturation much stronger and asperate bella, Blackb.
HH. Upper surface not entirely green.
I. Tooth on anterior femora exceptionally small.
J. Elytra with well-defined lines of whitish pubescence perplexa, Blackb.
JJ. Elytra uniformly pubescent ... suaveola, Germ.
II. Tooth on anterior femora normally large ... ... læta, Blackb.
FF. Hind femora dentate ... hirta, Blackb.
CC. Upper surface not metallic ... suturalis, Chap.
AA. Upper surface glabrous.
B. Prothorax dentate laterally ... ... singularis, Blackb.
BB. Prothorax unarmed ... ... glabra, Blackb.

E. chrysura, Germ. Minus brevis; nitida; sparsim pilosa, pilis in elytris haud fasciculatis; supra læte metallica, colore

variabilis ; antennarum articulis 1-4 testaceis (1° supra viridi excepto), 5° 6° que ad apicem infuscatis, 7-11 (nonnullis exemplis 7° ad basin excepto) piceis ; corpore subtus æneo vel nigro, griseo-pubescenti ; femoribus æneis ; tibiis testaceis, harum apice tarsisque infuscatis ; palpis basi testaceis apice piceis ; prothorace quam longiori multo latiori, antice minus angustato crebre rugosule punctulato et transversim fortiter strigato, lateribus regulariter rotundatis, basi bisinuata, margine antico bisinuato in medio sat producto, angulis obtusis, posticis certo adspecto subdentatis, scutello crebre nec profunde punctulato ; elytris quam prothorax quarta parte latioribus, fere ut prothorax sculpturatis sed etiam magis fortiter transversim rugatis ; prosterno et mesosterno inter coxas valde (et inter se æqualiter) latis.

Mas. Tarsorum anticorum et intermediorum articulo basali fortiter dilatato subovali ; abdomine pilis erectis sat longis insigni, segmento 1° ventrali in medio planato-elevato, parte planata glabra subtilissime transversim strigata ; tibiarum posticarum parte tertia apicali deformi introrsum valde incurva, spina apicali nulla. Long., $3\frac{3}{4}$—4 l. ; lat., $1\frac{3}{4}$—2 l.

The prothorax is about three-fifths again as wide as long.

S. Australia ; common.

E. varians, sp. nov. Subelongata ; nitida ; sparsim pilosa, pilis in elytris haud fasciculatis ; supra læte metallica, colore fere ut *E. chrysuræ* sed tibiis ad apicem vix picescentibus ; prothorace fere ut *E. chrysuræ* sed minus fortiter transverso, multo minus crebre nec rugosule punctulato, haud distincte transversim rugato ; scutello punctulato ; elytris fere ut *E. chrysuræ ;* prosterno et mesosterno inter coxas minus latis.

Mas. Tarsis fere ut *E. chrysuræ* sed anticorum articulo basali breviori ; abdomine pilis longis erectis insigni, segmento ventrali basali in medio planato transversim subtilissime strigato haud elevato ; tibiis posticis ad apicem fortiter abrupte incurvis, ad apicem exteriorem spina armatis. Long., $3\frac{1}{2}$ l. ; lat., $1\frac{3}{4}$ l.

The prothorax is scarcely more than half again as wide as long.

S. Australia ; common near Port Lincoln.

E. diversicollis, sp. nov. Elongata ; nitida ; sparsim pilosa, pilis in elytris haud fasciculatis ; supra læte metallica, colore fere ut *E. chrysuræ ;* prothorace quam longiori vix dimidio latiori, subtiliter sat sparsim punctulato, lateribus valde rotundatis, margine antico antrorsum fortiter æqaliter convexo, nullo modo (basi vix) bisinuato, angulis vix manifestis ;

scutello vix punctulato; elytris quam prothorax tertiâ parte latioribus, fere ut *E. chrysuræ* sculpturatis sed paullo minus crasse; prosterno et mesosterno inter coxas minus latis.

Mas. latet. Long., $3\frac{1}{2}$ l.; lat., $1\frac{3}{5}$ l.

Very distinct by the front margin of the prothorax being absolutely without sinuation, even at its outer extremities. In the absence of the male I cannot be certain that this species should be placed in this section.

Australia; I do not know the exact habitat of this species.

E. Froggatti, sp. nov. Minus elongata; nitida; sparsim pilosa, pilis in elytris haud fasciculatis; supra læte metallica, colore fere ut *E. chrysuræ* sed tibiis apice vix infuscatis et antennarum articulis omnibus (basin versus utique) testaceis vel piceo-testaceis; prothorace quam longiori circiter dimidio latiori, fortiter minus crebre punctulato, lateribus sat fortiter rotundatis, margine antico ad latera sinuato in medio antrorsum late fortiter convexo, basi bisinuato, angulis anticis distinctis posticis certo adspectu dentatis; scutello haud punctulato elytris fere ut *E. chrysuræ* (sed manifeste—præsertim postice—minus crasse) sculpturatis; prosterno et mesosterno inter coxas sat latis; femoribus posticis vix dentatis.

Mas. latet. Long., $3\frac{1}{5}$ l.; lat., $1\frac{3}{5}$ l.

The lævigate nitid scutellum furnishes a very distinctive character.

N.S. Wales; taken by Mr. Froggatt in the Blue Mountains.

E. spinicollis, sp. nov. Ovalis; nitida; sparsim pilosa, pilis in elytris fasciculatis; supra læte metallica; colore ut *E. chrysuræ;* prothorace quam longiori dimidio latiori, antice leviter angustato, crebre rugosule punctulato et transversim sat fortiter strigato, lateribus regulariter rotundatis, basi margineque antico bisinuatis, angulis anticis spiniformibus posticis obtusis; scutello sat fortiter punctulato; elytris fere ut prothorax sculpturatis sed magis fortiter transversim rugatis; prosterno et mesosterno inter coxas valde latis.

Mas. Tarsorum anticorum et intermediorum articulo basali modice dilatato; abdomine haud pilis erectis vestito, segmento basali in medio elevato planato, parte planata subtilissime transversim strigata; tibiis posticis apice minus fortiter incurvis. Long., $3\frac{1}{5}$ l.; lat., $1\frac{3}{5}$ l.

Extremely like the species which I take to be *E. varipes*, Boisd.; indeed, I regard it as possibly an extreme Alpine form of that insect, which differs from the present one by its entirely testaceous antennæ, and its legs also testaceous, except the infus-

cate apex of the tarsi, as well as by its prothorax very evidently wider at the base as compared with the width of the base of the elytra. *E. varipes* (?) moreover is nearly always of an obscure brassy colour above, whereas all the examples I have seen of the present species are bright blue or green, or coppery red. I may add that the description of *E. varipes* is so defective that it is little more than a guess to attribute any insect to it. The brassy colour and fasciculated elytral pilosity are the only distinctive characters mentioned, and the colour of the legs and antennæ, the size, and the sexual characters are all omitted. *E. varipes* (?) is found in N.S. Wales.

Victoria; in the Alpine district.

E. distincta, sp. nov. Modice elongata; nitida; sparsim pilosa, pilis in elytris fasciculatis; supra læte metallica; colore ut *E. chrysuræ* sed pedibus (tarsis apicem versus exceptis) antennisque (articulis 1° supra ceterisque ad apicem summum, exceptis) testaceis; prothorace quam longiori fere duplo latiori, antice leviter angustato, fortius minus crebre punctulato, lateribus leviter arcuatis, basi valde (margine antico leviter) bisinuata, angulis omnibus distinctis vix acutis; scutello punctulato; elytris crebre fortiter punctulatis et fortiter transversim rugatis (fere ut *E. chrysuræ*).

Mas. Latet.

Much like *E. varians*, but distinguished *inter alia* by its flavescent femora, very strongly transverse prothorax, and much more roughly punctured elytra.

Victoria; Alpine district.

E. minor, sp. nov. Modice elongata; nitida; sparsim pilosa, pilis in elytris haud fasciculatis; supra læte metallica, colore fere ut *E. chrysuræ* sed tibiis apice vix infuscatis; prothorace quam longiori paullo plus tertia parte latiori, cetera ut *E. Froggatti*; scutello obscure punctulato; elytris fere ut *E. chrysuræ* sed postice minus fortiter sculpturatis; prosterno et mesosterno inter coxas sat latis; femoribus posticis vix dentatis.

Mas. Fere ut *E. chrysuræ*, sed segmento basali ventrali in medio haud elevato, tibiis posticis apice haud intus curvatis

Femina latet. Long., $2\frac{4}{5}$ l.; lat., $1\frac{2}{5}$ l.

Very like *E. Froggatti*, but considerably smaller, with the prothorax less transverse, and the front part of the elytra very much more roughly sculptured; the sexual characters of the male also are probably different.

S. Australia.

E. ænea, sp. nov. Ovalis; sat parallela; pube grisea vestita, hac in elytris circiter 6-seriatim longitudinaliter disposita;

obscure ænea, labro antennis femorum tibiarumque basi rufis, antennarum articulis apice piceis, clypeo antice scutelloque viridibus; capite prothoraceque opacis coriaceis obsolete punctulatis; hoc quam longiori plus dimidio latiori, antice parum angustato subtruncato, lateribus leviter arcuatis, basi vix bisinuata, angulis obtusis; scutello crebre aspere punctulato; elytris subnitidis, vix substriatis, basin lateraque versus subrugosule punctulatis et obscure transversim rugatis alibi crebre subtiliter nec rugosule punctulatis.

Mas. Tarsorum anteriorum 4 articulo basali fortiter dilatato; tibiis posticis apice abrupte breviter incurvis; segmento ventrali basali in medio planato glabro nitido fere impunctulato. Long., $2\frac{1}{5}$ l.; lat., 1 l.

Victoria; Alpine district.

E. perplexa, sp. nov. Ovalis, subparallela; pilis fulvis vestita, his in elytris lineis crebris dispositis; capite prothorace scutelloque opacis coriaceis vix manifeste punctulatis læte viridibus; elytris obscure aureo-olivaceis, labro palpis antennis (harum articulis plus minus nigro-terminatis) pedibusque testaceis; prothorace quam longiori dimidio latiori, antrorsum vix angustato, antice posticeque bisinuato, lateribus modice rotundatis, angulis obtusis; scutello punctulato; elytris utrinque juxta scutellum subgibbosis, leviter subtilius sat crebre punctulatis, antice et latera versus transversim rugatis, et ibi magis crasse punctulatis; femoribus anticis dente parvo armatis, posticis muticis.

Mas. Tarsorum anteriorum 4 articulo basali sat dilatato; tibiis posticis apice manifeste nec fortiter incurvis; abdomine setis longis erectis vestito, segmento basali in medio planato pernitido lævigato. Long., 2 l.; lat., 1 l.

This species appears to be intermediate between Dr. Chapuis' sub-genera *Edusina* and *Edusella*, the posterior tibiæ in the male having their apex very briefly but quite distinctly bent inwards, the process, however, being so short that it might easily be passed over without notice. The tooth on the front femora is scarcely larger than in *E. suaveola*, Germ.

Victoria; sent to me by C. French, Esq

E. lineata, sp. nov. Ovalis; sat parallela; pube grisea vestita, hac in elytris circiter 8-seriatim longitudinaliter læte dispositis; obscure ænea, labro antennis pedibusque (tarsis obscurioribus) læte testaceis; cetera ut *E. ænea*.

Mas. Fere ut *E. ænea*, sed tibiis posticis apice nullo modo incurvis. Long., $2\frac{1}{5}$ l.; lat., 1 l.

This species is remarkably like the preceding. It scarcely differs from it, except in the colouring—the legs (except the

tarsi) being clear testaceous, and the elytra much more conspicuously striped with pale grey—and in the hind tibiæ of the male being straight. I have seen eight specimens of this species (of both sexes), and two males of the former, and the differences seem quite constant. I do not think that they can be regarded otherwise than as two good species. Dr. Chapuis' arrangement of *Edusa* would place them in distinct sub-genera.

I have before me two female examples scarcely differing from this species except in being of a bright rosy colour with legs entirely testaceous and having the basal part of the elytra more distinctly rugulose. In the absence of the male, I am at a loss to determine whether they represent a distinct species.

Victoria; Alpine district.

E. lata, sp. nov. Ovalis; pilis griseis æqualiter sat dense vestita; capite prothoraceque opacis coriaceis obsolete sparsim punctulatis, illo (scutelloque) læte viridibus, hoc aureo-brunneo certo adspectu viridi-micanti; elytris sat nitidis aureo-brunneis subcupreo-micantibus, corpore subtus viridi, abdomine aureo-micanti, labro antennis palpis pedibusque læte testaceis; prothorace quam longiori vix dimidio latiori, in medio longitudinaliter obsolete carinato, antrorsum parum angustato, antice bisinuato in medio sat producto, lateribus leviter arcuatis, basi leviter bisinuata, angulis obtusis; scutello punctulato; elytris leviter subtilius sat crebre punctulatis subhumeris vix transversim rugatis, puncturis basin versus et ad latera crassioribus; femoribus anticis dente magno armatis, posticis muticis.

Mas. Tarsorum anteriorum 4 articulo basali modice dilatato; tibiis posticis apice haud incurvis abdomine in medio setis longis erectis vestito, segmento basali in medio planato pernitido fere lævigato. Long., $2\frac{1}{5}$ l. (vix); lat., 1 l.

This species bears much resemblance to *E. suaveola*, Germ., from which, however, it may be at once distinguished by the much larger tooth of the anterior femora.

Victoria; Alpine district.

E. bella, spec. nov. Ovalis; sat parallela; pube aurea subtili æqualiter sat dense vestita; supra omnino læte prasina subtus viridis, abdomine aureo-micanti; labro palpis antennis pedibusque testaceis; capite prothoraceque opacis coriaceis obsolete sparsim punctulatis; prothorace fere ut *E. lætæ* sed haud carinato, antice in medio parum producto; scutello punctulato; elytris femoribusque fere ut *E. lætæ*, sed femorum anticorum dente minori.

Mas. Tarsorum anteriorum 4 articulo basali modice dilatato; tibiis posticis apice haud incurvis; abdomine in medio setis

longis erectis vestito, segmento basali in medio vix planato. Long., $1\frac{4}{5}$ l.; lat., 1 l. (vix).

This species (of which I have both sexes) might almost pass for a small differently coloured form of *E. læta*, but on careful examination I am convinced that it is really distinct, the prothorax having its front margin evidently less produced in the middle, and being quite devoid of the faint carina which runs down the middle in the latter; the basal ventral segment in the male, moreover, is much less lævigate.

Victoria; Alpine district.

E. glauca, sp. nov. Sat breviter ovalis; sat nitida; pube supra aurea subtus grisea sat dense vestita; supra sat pallide viridis vix aureo micans, subtus magis ænea, labro palpis antennis pedibusque testaceis; capite prothoraceque subcoriaceis leviter minus crebre punctulatis; hoc quam longiori dimidio latiori, antrorsum vix angustato, antice fortiter bisinuato in medio late fortiter producto, lateribus fere rectis, basi bisinuata, angulis obtusis; scutello punctulato; elytris crebre subtiliter punctulatis, latera versus paullo magis fortiter punctulatis et vix transversim rugatis; femoribus anticis dente mediocri armatis, posticis muticis.

Mas. Tarsorum anteriorum 4 articulo basali parum dilatato; tibiis posticis apice haud incurvis; abdomine in medio setis paucis longis erectis vestito, segmento basali in medio planato nitido fere lævigato. Long., $1\frac{4}{5}$—2 l.; lat., 1—$1\frac{1}{5}$ l (vix).

Of a paler, more "dead" green colour than *E. bella*, otherwise closely resembling it in colour, but at once distinguishable by much finer puncturation of the elytra and the much more distinct puncturation of the prothorax. The tooth on the anterior femora is very evidently larger than in *E. suaveola*, Germ.

S. Australia; not uncommon on flowers near Port Lincoln.

E. pilifera, sp. nov. Breviter ovalis; sat nitida; pilis griseis brevibus æqualiter sat dense vestita, nonnullis in elytris intermixtis multo longioribus erectis nigricantibus; rosea-metallica, subtus obscure ænea, labro antennis palpis pedibusque rufo-testaceis; capite prothoraceque distincte leviter sat sparsim punctulatis, hoc quam longiori fere duplo latiori, antrorsum vix angustato, antice fere truncato, basi rotundata, lateribus leviter arcuatis, angulis obtusis; scutello punctulato; elytris leviter minus subtiliter sat crebre punctulatis, sus humeris sat fortiter transversim rugatis et ibi crasse fortiter punctulatis; femoribus anticis dente parvo armatis, posticis muticis.

Mas latet. Long., $1\frac{4}{5}$ l.; lat., 1 l.

A very distinct species, much shorter and wider than any of

the preceding, and with coarser puncturation; the erect long hairs on its elytra are also a good character. The tooth on the anterior femora is not much larger than in *E. suaveola*, Germ.

Victoria; Alpine district.

E. fraterna, sp. nov. Ovalis; sat nitida; pilis albidis et nonnullis elongatis erectis fulvis, confuse vestita; obscure ænea, labro palpis antennis (harum articulo basali supra et ultimis ad apicem obscurioribus) femorum basi tibiisque testaceis; capite prothoraceque crebre sat fortiter punctulatis; hoc quam longiori vix dimidio latiori, antrorsum parum angustato, antice in medio late sat fortiter producto, lateribus sat fortiter rotundatis, basi vix bisinuata, angulis rotundato-obtusis; scutello punctulato; elytris sat fortiter rugosule punctulatis, apicem versus substriatis, pone humeros fortiter transversim rugatis; femoribus anticis dente sat magno armatis, posticis muticis.

Mas. Tarsorum anticorum articulo basali modice (intermediorum vix manifeste) dilatato; tibiis posticis apice haud incurvis; segmento 1° ventrali in medio pernitido lævigato. Long., 2 l.; lat., 1 l.

Resembles *E. perplexa* in colour and build, but *inter alia* is very much more coarsely punctured, and the hind tibiæ of the male are not at all incurved at the apex.

Victoria; Alpine district.

E. hirta, sp. nov. Breviter ovalis; sat nitida; densissime æqualiter griseo-pubescens; supra roseo-cuprea, subtus ænea, clypeo viridi, labro palpis antennis pedibusque (horum, nonnullis exemplis, femoribus tibiisque apice plus minus infuscatis) testaceis; capite prothoraceque subcoriaceis obsolete punctulatis; hoc quam longiori fere duplo latiori, antrorsum parum angustato, antice profunde bisinuato, in medio late fortiter producto, lateribus leviter arcuatis, basi leviter bicinuata, angulis anticis productis sat acutis, posticis obtusis; scutello punctulato; elytris substriatis, crebre minus fortiter (latera versus magis fortiter) punctulatis, sub humeros obscure transversim rugatis; femoribus anticis dente sat magno, posticis sat parvo, armatis.

Mas. Tarsorum anticorum articulo basali sat fortiter (intermediorum vix manifeste) dilatato; tibiis posticis apice haud incurvis; segmento 1° ventrali in medio paullo minus crebre punctulato. Long., $1\frac{1}{2}$—2 l.; lat., $\frac{4}{5}$—1 l.

The dense grey pubescence under which the sculpture and colouring is buried will distinguish this species from all known to me of its congeners.

S. Australia; Yorke's Peninsula.

E. pavens, sp. nov. Sat breviter ovalis; sat nitida; pilis griseis brevibus æqualiter sat dense vestita, nonnullis intermixtis longioribus erectis nigricantibus; ænea, labro palpis antennis pedibusque testaceis; capite prothoraceque sat subtiliter sat crebre punctulatis; hoc quam longiori circiter dimidio latiori, antrorsum haud angustato, antice in medio late valde producto, basi manifeste bisinuata, lateribus subdeplanatis fortiter rotundatis, angulis anticis fere rotundatis posticis obtusis; scutello punctulato; elytris subfortiter punctulatis et transversim rugatis; femoribus anticis late angulatis vix dentatis, posticis muticis; antennis minus elongatis apicem versus subincrassatis.

Mas. Latet. Long., $1\frac{1}{2}$ l.; lat., $\frac{4}{5}$ l. (vix).

This little species resembles *E. fraterna* in the stiffish erect bristles with which it is clothed, and also resembles *E. Meyricki* (vide infra) in general appearance and its antennal structure, but differs widely from both *inter alia* in the shape of its prothorax, and from the latter in its much coarser sculpture.

W. Australia; taken by E. Meyrick, Esq.

E. Meyricki, sp. nov. Sat breviter ovalis; sat nitida; sat æqualiter sat dense griseo-pubescens; ænea subcuprascens, labro palpis antennis (articulo 1° supra et ultimis apicem versus exceptis) pedibusque testaceis; capite prothoraceque subcoriaceis et leviter sat sparsim punctulatis; hoc quam longiori dimidio latiori, antrorsum sat angustato, antice leviter bisinuato in medio late sat fortiter producto, lateribus modice rotundatis, basi leviter bisinuata, angulis anticis fere acutis posticis rectis; scutello punctulato; elytris leviter vix crebre (latera versus paullo crassius et hic obscure transversim rugatis) punctulatis, femoribus anticis late angulatis vix dentatis, posticis muticis; antennis minus elongatis apicem versus subincrassatis.

Mas. Tarsorum anteriorum 4 articulo basali fortiter dilatato; tibiis posticis apice haud incurvis; segmento ventrali basali in medio subplanato sublævi. Long., $1\frac{1}{5}$ l.; lat., 1 l.

The whitish grey pubescence on the elytra is here and there condensed into a somewhat conspicuous patch or tuft, but it is possible that this may be due to the rest of the surface being a little abraded in my unique example. The antennæ shorter than usual in the genus, and having the apical joints a little incrassated furnish a very noticeable character.

W. Australia; taken by E. Meyrick, Esq.

E. inermis, sp. nov. Ovalis; nitida; pube aureo-fulva sat æqualiter sat dense vestita; viridi-metallica, labro palpis antennis pedibusque testaceis; capite prothoraceque fortius

minus crebre punctulatis ; hoc quam longiori circiter dimidio latiori, antrorsum vix angustato, margine antico vix sinuato antrorsum producto, basi vix bisinuata, lateribus sat fortiter rotundatis, angulis anticis fere rectis posticis obtusis ; scutello punctulato ; elytris sat fortiter sat crebre punctulatis, antice latera versus subcrasse rugatis ; femoribus muticis ; antennis quam corpus sat brevioribus.

Maris tarsorum anteriorum 4 articulo basali modice dilatato ; tibiis posticis apice haud incurvis ; abdomine setis longis erectis vestito ; segmento basali in medio subplanato pernitido sublævi obscure transversim rugato. Long., $1\frac{3}{5}$ l. ; lat., $\frac{4}{5}$ l.

The sculpture of the elytra is much like that of *E. pavens*, but the prothorax is much more strongly and less closely punctulate. This species also probably resembles *E. evanescens*, Boh., but the latter appears to be a considerably smaller insect still, with the clypeus yellow, the head opaque, and the antennæ as long as the body.

S. Australia ; a single example in the S. Australian Museum,

E. glabra, sp. nov. Breviter ovalis, lata ; glabra ; colore variabilis, viridis vel purpurea, labro palpis antennis pedibusque (horum trochanteribus nigris) testaceis ; capite prothoraceque subtiliter (hoc ad latera, fortius) minus crebre punctulatis ; hoc quam longiori fere duplo latiori, antrorsum angustato, antice fortiter bisinuato, basi fortiter bisinuata, lateribus leviter arcuatis, angulis anticis acutis posticis obtusis ; scutello vix punctulato ; elytris sat fortiter subseriatim (seriebus subgeminatis) punctulatis, apicem versus substriatis, vix transversim rugatis ; femoribus anticis dente parvo armatis, posticis muticis ; tibiis extus obscure longitudinaliter canaliculatis ; antennis quam corporis dimidium sat longioribus.

Mas. Tarsorum anteriorum 4 articulo basali fortiter dilato ; tibiis posticis haud apice incurvis ; abdomine (exempli masculi unici) fracto. Long., $1\frac{1}{2}$—$1\frac{4}{5}$ l. ; lat., $\frac{4}{5}$—$1\frac{1}{5}$ l. (vix).

This species presents several of the distinctive characters attributed to *Cleptor*, but its dentate anterior femora and antennæ —quite two-thirds the length of the whole body—forbid its being placed in that genus.

E. singularis, sp. nov. Ovalis ; nitida ; glabra ; colore variabilis (ænea vel violacea vel cuprea), antennarum palporumque basi pedibusque rufo-brunneis ; capite fortiter confuse vix crebre punctulato ; prothorace quam longiori fere duplo latiori, antrorsum sat angustato, antice bisinuato in medio late sat fortiter producto, crasse rugulose minus crebre

punctulato, lateribus fortiter rotundatis tridentatis, basi bisinuata, angulis anticis spiniformibus posticis breviter dentatis; scutello lævi; elytris fortiter punctulatis, postice striatis minus fortiter punctulatis, latera versus transversim valde rugatis; femoribus anticis dente parvo armatis, posticis muticis; tibiis extus canaliculatis.

Mas. Tarsorum anteriorum 4 articulo basali valde dilatato; tibiis posticis haud apice incurvis; abdomine setis longis erectis vestito, segmento basali in medio planato, penultimo in medio lævigato pernitido, ultimo fossa profunda instructo. Long., 3 l.; lat., $1\frac{1}{2}$ l.

A remarkable insect, with no near ally among described species; it might perhaps be regarded as the type of a new genus. In some of its characters it agrees with *Cleptor*.

Victoria; Alpine district.

COCCINELLIDÆ.

ORCUS.

O. cœlestris, sp. nov. Sat fortiter convexus; sat nitidus; supra cœruleus, viridi violaceoque micans; subtus niger—antennis, tarsis, tibiis anticis et abdomine testaceis; capite sparsim subtiliter, prothorace subtiliter minus sparsim, elytris sat crebre subfortiter, punctulatis. Long., $1\frac{4}{5}$ l.; lat., $1\frac{3}{5}$ l. (vix).

A very pretty species, resembling in colour *O. cyanocephalus*, Muls., and *chalybeus*, Boisd., but scarcely so convex as either of those insects, and much more strongly and closely punctured than either of them, or than *O. Australasiæ*, Boisd. From *O. cyanocephalus* it differs also in the colour of the legs, and from *O. chalybeus* in the more strongly rounded sides of the prothorax. *O. Lafertei*, Muls., I have not seen, but it appears to be a larger insect, of somewhat similar colour, but having some conspicuous violet spots symmetrically arranged on the prothorax.

N. Territory of S. Australia.

Description of a New Genus and Species of Marsupialia, "*Notoryctes typhlops.*"*

By E. C. Stirling, M.A., M.D

Lecturer on Physiology in the University of Adelaide, Hon. Director of the South Australian Museum.

[Read February 3, 1891].

The first specimen of this animal, received by the South Australian Museum, was forwarded by the courtesy of Mr. A. Molineux, Secretary of the Agricultural Bureau. Wrapped merely in a rag saturated with kerosine and enclosed in a revolver-cartridge box, it had travelled over a thousand miles largely by packhorse and coach. Consequently it was in a very bad condition on arrival in Adelaide. On this specimen, which appeared to be a female, were based some preliminary notes communicated to the Royal Society of South Australia on the 4th September, 1888, and an almost similar communication was made to the correspondence columns of '*Nature*' shortly afterwards. Some few months subsequently I received three more specimens, all males, of which one only was in anything like good preservation. The reasons for the delay in the publication of the present description, which is based upon an examination of the four specimens then to hand, and for the new name under which it now appears, are explained in a concluding paragraph. By the kindness of His Excellency the Governor, Lord Kintore, I have recently had the opportunity of making, with him, the complete transit from North to South of the Australian Continent. Though the opportunity of traversing the zoologically unexplored regions of Central Australia would, under any circumstances, have proved an attractive programme, a special inducement for the journey was afforded by the fact that our route must pass through the tract of country in which the animal had been found, and hence arose the possibility of my being able to secure additional specimens. In this expectation I have happily been successful, for, I was fortunate enough to secure six complete examples, and one skeleton. Amongst these are four females, which sex had been represented only by the first specimen. This, however, was so much decomposed as to leave some doubt of its character. On my return from the transcontinental journey, I found the present

* The name "Psammoryctes," originally selected for this new genus, having been already appropriated, that here employed is substituted.

paper in the printer's hands, and it will be submitted practically as I left it. Nevertheless, I am now in a position to offer some interesting particulars of its habits, which were obtained on my journey, and also to verify the important fact of the existence of a well-marked pouch in the female, on which point I could not at first be absolutely certain from the bad condition of the soft parts in the first specimen received. Unfortunately, an accidental circumstance together with certain political exigencies made it necessary that His Excellency's journey should be made with greater rapidity than could be wished from my point of view, and it thus became impossible for me to reach the exact locality where the specimens had been found; but I passed within fifty miles of the spot, and through country which is of a precisely similar character. Further, I had the advantage of meeting on our journey the man who himself captured the first specimen sent down, and by the kind consideration of the manager of the Idracowra Station, their book-keeper, Mr. J. F. Bishop, was instructed to wait for me at a stated locality through which our track must pass. To Mr. Bishop's zealous efforts I owe the whole of the last lot of specimens, as well as much valuable information concerning their habits and habitat. As may be imagined, it was with feelings of much satisfaction that, on reaching our camp one evening at the Horse-shoe Bend of the Finke River, I met Mr. Bishop with his welcome complement of specimens safe in his saddle-bags. From Mr. C. Benham also, who had previously been employed on the same run, and by whom the first specimen was forwarded to the Museum, I have also received much valuable information concerning the animal. Both Mr. Bishop and Mr. Benham have seen the animals alive, in a state of nature as well as in captivity, and the following notes comprise all the information that I could acquire from these two principal sources, as well as from some natives of the locality whom I questioned on the matter.

HABITS AND HABITAT.

It appears that the first specimen was captured by Mr. Wm. Coulthard, manager of the Frew River Station and other Northern runs belonging to the Willowie Pastoral Company. Attracted by some peculiar tracks, on reaching his camp one evening on the Finke River, while traversing the Idracowra Station with cattle, he followed them up and found the animal lying under a tussock of spinifex or porcupine grass *(Triodia irritans)*. Though he is an old bush hand, with all the watchful alertness and powers of observation usually acquired by those who live lives of difficulty and danger, this was the first and only specimen of the animal he ever saw. As previously stated, this found its way to the Museum through the agency of Messrs. Benham and

Molineux. The three subsequently received shortly afterwards, as well as the last lot recently secured by Mr. Bishop during our journey through the country, were also found on the Idracowra Station. This is a large cattle-run comprising several hundred square miles of country in the southern part of the Northern Territory of South Australia, which lies immediately to the West of the telegraph line between the Charlotte Waters and Alice Springs Stations. The great dry watercourse of the Finke River, which runs from N.W. to S.E., bounds the run for some eighty miles on the North and North East. Its distance from Adelaide is roughly speaking a thousand miles. Flats and sandhills of red sand, more or less well covered with spinifex and acacias, constitute a large portion of the country, and the rainfall is inconsiderable. Curiously enough, all the specimens hitherto received by me have been found within a circumscribed area, four miles from the Idracowra Head Station, which is situated on the Finke watercourse itself, and almost invariably amongst the sandhills. I have it, however, on very fair authority, that the animal has been seen on the Undoolya Station, which lies immediately South of the McDonnell Ranges, and that one also was found drowned after heavy rain at Tempe Downs, a station situated about 120 miles W.S.W. of Alice Springs. These points will sufficiently define its range, so far as is known at present. They do not appear to be very numerous. Very few of the white men in the district had ever seen it, even though constantly travelling, and not many of the natives whom I came across recognised the well-executed coloured drawing I carried with me. It must be remembered, however, that I did not pass through the exact spot which so far appears to be its focus of distribution. Nor did a very considerable reward, which I offered, cause any specimens to be forthcoming between the first lot received, over two years ago, and that recently secured during my transcontinental trip. With few exceptions the animals have been captured by the aboriginals, who, with their phenomenal powers of tracking, follow up their traces until they are caught. For this reason they can only be found with certainty after rain, which sets the surface of the sand and enables it to retain tracks that would immediately be obliterated when it is dry and loose. Nor are they found except during warm weather. So that the short period of semi-tropical summer rains appears to be the favourable period for their capture. For this suitable combination of wet and warmth, Mr. Bishop had to wait three months before he was able to get them, and in all cases they were found during the day time. Perpetual burrowing seems to be the characteristic feature of its life. Both Mr. Bishop and Mr. Benham, who have seen the animal in its native state, report that

emerging from the sand it travels on the surface for a few feet, at a slowish pace, with a peculiar sinuous motion, the belly much flattened against the ground while it rests on the outsides of its fore-paws, which are thus doubled in under it. It leaves behind it a peculiar sinuous triple track, the outer impressions, more or less interrupted, being caused by the feet, and the central continuous line by the tail, which seems to be pressed down in the rear. Constantly on the look-out for its tracks, I was often deceived by those of numerous lizards, which are somewhat similar in these respects. It enters the sand obliquely and travels underground either for a few feet or for many yards, not apparently reaching a depth of more than two or three inches, for whilst underground its progress can often be detected by a slight cracking or moving of the surface over its position. In penetrating the soil free use, as a borer, is made of the conical snout with its horny protecting shield, and the powerful scoop-like fore-claws are also early brought into play. As it disappears from sight, the hind limbs, as well, are used to throw the sand backwards, which falls in again behind it as it goes, so that no permanent tunnel is left to mark its course. Again emerging, at some distance, it travels for a few feet upon the surface and then descends as before. I could hear nothing of its making, or occupying at any time, permanent burrows. Both my informants lay great stress on the phenomenal rapidity with which it can burrow, as observed both in a state of nature and in captivity. In some notes sent me by Mr. Benham the following statement appears:—"Almost any of the men here (Idracowra) can tell you how one got away from me in the loose sand. I brought it home alive, and began talking about how fast it could burrow, so Mr. Stokes wanted to see it. We took a spade and loosened the top soil near the house, and put it down; I kept my hand close to it until it was nearly out of sight, and then started scratching after it, but it was too quick; so I took a shovel and began to dig after it, but could not get him. One of the men then came with another shovel, and also a lubra (aboriginal female) who scratched, but the three of us failed to get him." Making all allowances for possible misdirected energies in this experiment, there is no doubt but that their burrowing powers are remarkable. Mr. Bishop, who knew of my approach, made great efforts to keep alive for me some of those he had captured, and placed them for safe keeping in buckets of sand, but in spite of all care and attention one only lived as long as four days. Night and day the sound of their ceaseless burrowing was to be heard. Acting on my advice, previously given, in consequence of an examination of the contents of the intestines of one of the earlier specimens, he supplied them with

ants as food, but they ate none. They did, however, eat one "witchety," the native name of large white grubs, much relished by the blacks as an article of food, which are the larval forms of certain Longicorn beetles and Lepidoptera, and Mr. Benham informed me that one of his ate a piece of bread on one occasion, but it only lived a day. They thus appear to stand captivity extremely badly. On being handled they make no attempt to bite. No blackfellow that I questioned had ever seen the young, nor did they know anything whatever of any nests or breeding places used by them. Their native name is "oor-quámata," the terminal "*r*" of the first syllable being much rolled so as almost to convey the sound of an interpolated short "*i*" between the "*r*" and the "*q*"; the accentuated syllable is strongly marked, the vowels having the same value as in "quarrel." Mr. Benham stated that the natives have a superstitious dread of them, and applied to one the term "kudoicka," which they translate as "devil-devil"; but I could not get this confirmed by any of the blacks I saw. In fact the natives seem to know very little about them and could give me no information whatever as to what their food was or whether they got it under or above ground. With the material at my disposal I should be able definitely to settle this point, and indeed, in one of my first specimens, I did most certainly find the remains of ants and some other insect debris in what remained of the intestines; but as the Editor of these Transactions urgently calls for the completion of this paper, I am reluctantly obliged to postpone to a future issue the result of further investigation on this and other points.

GENERAL DESCRIPTION.*

(Pl. II., III., and IV.)

The fur, in the three specimens (all males) in which it was sufficiently well preserved for accurate description, may be described as being generally of a light fawn colour, long, soft and of a bright lustrous and silken appearance. In parts it deepens to a glistening golden hue, and in others it inclines more to a silvery aspect. In the last specimen received, which was in a much better state of preservation than any of its predecessors, the fur was considerably lighter than in the others, and the silvery tint more pronounced. The colours of all these have faded considerably

* It will be remembered that the following description is based upon an examination of the first four specimens received in 1888 and 1889. One only of these had been satisfactorily preserved in spirit; all the others were merely wrapped in rag saturated with kerosine and enclosed in small tin boxes. I have, however, incorporated some additional information, having reference to the pouch in the female.

since they have been kept in spirit, but plates II. and III., which were made soon after their receipt, give a fair idea of the original colour.* In two, the fawn changed to a darker and somewhat rusty tint round the root of the tail, both on the upper and under surface; but this was scarcely marked in the lighter coloured specimens. Two also showed a distinctly darker coloured patch on the back over the region of the pelvis.

The shoulder, being brought forwards close up to the skull, leaves no appearance externally of a neck, and the head together with the front portion of the trunk, gradually widening from the snout backwards to the shoulders, form a sort of blunt-ended cone, which is flattened somewhat on its under surface and directed downwards. This, with a curiously similar ventral flexion of the posterior part of the trunk and tail, gives the whole body a characteristically arched appearance, so that when placed on a flat surface the snout, hands, feet, and tail are almost in the same plane.

The dorsal surface of the nose is covered with a hard horny shield, marked by a transverse ridge which divides it into an upper (posterior) and a lower (anterior) segment. The front margin of this shield bounds the external nares and is prolonged downwards on on each side of these apertures; it forms also the anterior border of the septum narium which is continuous with a horny plate of a similar texture, though less hard and horny, corresponding to the upper lip. The fur extends right up to the margins of the whole of this horny area; but immediately adjacent to its sides, and especially margining the upper lip, it is shorter, coarser, stiffer and of a lighter colour, approximating to the character of whiskers. This has been a trifle exaggerated in pl. II., fig. 2, and insufficiently expressed in fig. 1.

The nostrils looking downwards and forwards are wider in the transverse than in the vertical direction, and are rendered very irregular in outline from the encroachment of two processes from the surrounding horny shield—one from the upper the other from the outer margin.

The mouth, ventral in position, has, when viewed from that aspect, a contour represented by two sides of a slightly obtuse-angled triangle. The extreme point of the chin is destitute of hair, but on its under surface and margining the under lip there are the same short stiff hairs as on the upper lip. The tongue, fleshy, broad at the base and tapering to a blunt point, is somewhat similar in shape to the human tongue, but relatively longer and narrower.

No eyes are visible externally, and the smallest opening

* Plate III. does this more accurately than Plate II., in which latter the colour is represented as too uniformly golden, as well as a shade too dark.

through the skin corresponding to their position cannot be detected. The ear-openings are distinct, two mm. in diameter, though almost completely concealed by the fur which grows right up to their margins. The aperture is surrounded by a ring-like fold of the integument, which very slightly raises its margin above the level of the surrounding skin, and in the interior of the meatus are thickly-set vibrissæ. Its position is 15 mm. behind and above the angle of the mouth, measured along a line which would continue the normal direction of the mouth-slit backwards.

The tail is peculiar. Hard, tough, leathery in texture and appearance for the greater part, it is marked with conspicuous annular ridges to the point. Thick at its insertion, it tapers to a blunt or even knob-like tip. On the dorsal surface, the soft fur of the body extends over it for about half its length, but the ventral and lateral surfaces are bare nearly to the anus. At about its middle there are two lateral projections or tuberosities, which give increased width to the tail in that position, causing it to be there even wider than at the point of its insertion. This is particularly marked in one specimen, but in all, indications of the same peculiarity exist. The vent is margined by a ring of very long, straight hairs.

The limbs (Pl. II., III., IV.) are short and strong, the fur extending down to the manus and pes respectively. The fore-limb terminates in a manus of most peculiar construction, the structure of which is so distorted that it can hardly be understood without previous reference to its osteology, and in the absence of this I fell into error as to the order of the digits in my first description. It is so folded, that when seen in the position assumed by the preserved specimen, the two large conspicuous claws of the third and fourth digits conceal all the other parts from view, except the blunt and broad horny nail of the fifth, which is seen projecting at the posterior part of the base of the fourth. On the inner side of these, and separated from them by a deep cleft, which opens inferiorly and posteriorly, is a tough, leathery and much wrinkled palm, from which emerge the slender claw-like nails of the pollex and second digit. Thus, owing to this folding of the hand, the digits may be described as consisting of two rows with a cleft between them; the outer comprising the third, fourth, and fifth, and the inner the first and second. The wrinkled and baggy palm, corresponding to the latter two, covers them on their outer surface as far as the roots of the claws; posteriorly it overlaps them, and extends upwards to the base of the short nail of the fifth digit. On the dorsal surface of the hand, which faces inwards, the outlines of the first and second digits are evident, and the fur, here thin and sparse, extends only to the metacarpal region. The claws of these two are long, slender, narrow

and tapering, that of the first being the more so. The claws of the third and fourth are very large and strong, the former being 15 mm. x 4 mm., of uniform width and ending bluntly; the fourth, shorter but much wider at the base and triangular in shape, tapers rapidly to a point. The fifth is represented externally by a broad and stumpy nail.

The hind limbs (Pl. II., III., IV.) are also short and strong, and have the plantar surface of the pes turned almost directly outwards, so that its fifth digit lies in front. This surface is much wrinkled into several large baggy folds directed obliquely across the sole, and is covered with a leathery skin like that of the palm, which extends as far as the base of the nails, and even encroaches on their plantar surface. The claws of the hallux, second, third and fourth digit are concave on their plantar surface, and those of the third and fourth are curved both outwards and backwards. The fifth is represented by a strong and short stumpy nail, rather like that of the corresponding digit in the manus, and lies more towards the palmar surface than the others. The length of the fourth is six mm., and the others diminish in length towards the hallux. On the dorsal (inward) surface the course of the first four digits can be seen through the integument, and the skin covering them is free from hair as far upwards as the base of the metacarpals.

OSTEOLOGY.

THE SKULL.

(Pl. VI., fig. 1; Pl. VII., figs. 1 and 2.)

The outline of the skull, including the zygomata, is conical, with the occipital region expanded and well developed; anteriorly it tapers to the region of the exterior nares which are terminal, and, owing to the overhanging nasal bones, these orifices open downwards and forwards and have a quadrangular outline. The occipital plane is flat and almost vertical. Within the zygomatic arches the skull is constricted about the mid-region of the orbito-temporal fossæ, widening again considerably in the region of the juncture of the lachrymal and superior maxilla on each side. The vertex is smooth, without any median ridge and considerably flattened, and the bones throughout are exceedingly thin, papery and translucent.

The occipital foramen is almost circular, but slightly compressed laterally by the encroachment of the condyles. These also are compressed laterally and have their long axes running parallel and almost truly antero-posteriorly. From behind forwards (or from above downwards) their contour is almost semicircular, and their articular surfaces look backwards for their upper, and downwards

for their lower half. A line drawn touching the most posterior parts of both condyles lies almost exactly in the occipital plane.

No indication of a separate interparietal exists, nor can the outline between the occipital and parietal bones be distinguished; but at the juncture of the occipital plane with the vertex, and defining the limits of the former area, a well-marked almost semicircular occipital ridge occurs, which disappears at the level of the posterior (or upper) margin of the occipital condyles. From the occipital tubercle a slight vertical ridge runs downwards almost meeting the occipital foramen. On the vertex of the skull, a ridge for muscular attachment runs forwards and outwards, and then downwards from the occipital tubercle, till it becomes continuous with the upper edge of the zygoma. Close behind, and parallel to this ridge, are two smaller ridges which become merged into that just described at a point before it reaches the zygoma. (Pl. VI. and VII., fig. 1.) As between the occipital and parietal bones, no delimitation between the parietals and squamosals, or between the parietals and frontal, can be distinguished.

In front of the skull, the sutures can be distinguished, and the shape and extent of the nasals, superior maxillæ, premaxillæ and part of the lachrymals are as shown in fig. 1, Pl. VI. and VII. In the position of the opening of the lachrymal canal is a well marked circular depression, due to thinning of the bone; but I am unable to detect any patent orifice. The infraorbital foramen is large and transmits a very large nerve. The malar cannot be made out as a separate bone, but, springing from the malar region, opposite the penultimate molar tooth, proceeds a well marked zygomatic arch, so much compressed laterally throughout that it forms a thin vertical lamina, very narrow in front, but gradually widening as it proceeds backwards, until, in its posterior half, it becomes relatively very wide; a portion of its hinder end enters into the formation of the articular surface for the lower jaw, and forms a marked preglenoid prominence. The junction of the arch with the squamosal is close to the cranial part of the latter, so that very little of the arch itself is formed by the latter bone. The length of the arch is to that of the whole skull almost exactly as 1 to 3.

Behind, the glenoid surface is formed chiefly by the squamosal, which projects externally in the form of a reversely placed C-shaped ridge, the lower limb of the ridge running forwards and downwards and bounding the upper and front part of the auditory meatus, then, losing itself in the tympanic part of the auditory bulla, which latter projects forward under the glenoid cavity.

The auditory bulla (Pl. VI., fig. 1; and Pl. VII., fig. 2) is large and conspicuous, but has throughout exceedingly thin and fragile

walls. It extends so far backwards that it abuts against the anterior half of the occipital condyles, and reaches forwards to a point corresponding to about the middle of the zygomatic arch. Its anterior third is formed by the alisphenoid, the middle third by the tympanic, and, into the formation of the remainder, both the mastoid portion of the periotic and of the exoccipital appear to enter, but the latter cannot be, with certainty, defined from the other elements of the occipital bone.

In the anterior part of the orbito-temporal fossa, the lateral parts of the frontal and the lachrymal project outwards and somewhat backwards, forming a prominence, instead of a hollow, in the orbital region, which has exceedingly thin walls. Behind this prominence, and corresponding to about the junction of the anterior and middle third of the orbito-temporal fossa, the skull is constricted by a shallow groove passing downwards and backwards, corresponding to that which usually marks out the division between the orbital and temporal parts of the fossa. Behind this groove the cranium bulges a little, and is then again constricted by a similar groove, which runs downwards and a little forwards, nearly meeting the other above the sphenoidal fissure. (Pl. VI., and VII., fig. 1.) Behind this again, the skull broadens very rapidly towards the posterior root of the zygoma, at which point it is widest. Posteriorly the contours converge till they meet the lateral edge of the occipital plane. Sutures between the bones on the side of the skull, other than those mentioned, cannot with certainty be distinguished.

In a view of the inferior surface of the skull, almost the whole extent of the foramen magnum is seen, which thus faces very much downwards. Anteriorly, the basioccipital is completely ankylosed with the basisphenoid, though the junction is well defined by a transverse ridge. There are no paroccipital processes, and the exoccipitals have been described as forming part of the auditory bullæ.

Besides the basisphenoid, parts of the presphenoid, pterygoids and palate bones enter into the formation of the roof of the mesopterygoid fossa, which is wide anteriorly, but much narrowed behind. Its lateral walls are thin and lamelliform, curving inwards at their inferior edges, and the pterygoids end in well-marked, slender and backwardly-projecting hamular processes.

The contour line of the hard palate, including the alveolar borders, gives a markedly pyriform outline, being very wide opposite the middle of the molar series of teeth and tapering anteriorly. The bony palate has a straight posterior border, and its surface is arched transversely; at its junction with the lateral surfaces of the face a sharp edge-like alveolar border is formed, which abuts on the outer borders of the teeth. The junction between

the palatal and maxillary elements cannot be distinguished, and that between the maxilla and the premaxilla only indistinctly so. Two small and slit-like posterior palatine foramina can be made out in the wet skull (spirit) which transmit small nerves, but they are not distinguishable in the dry. The anterior palatine foramina are large and elongated. Besides these there are, in the hard palate, other smaller foramina irregularly placed, as well as several small circular or oval areas where the bone is much thinned. The posterior nares are compressed in a vertical direction.

With regard to the foramina of the base of the skull, the small size of the parts and the impossibility of distinguishing the sutures make it a little difficult to be sure of their position. The condylar and posterior lacerated foramina can, however, be distinguished in the usual situation, and the large canal for the carotid artery pierces the basiphenoid and passes almost directly upwards. The foramen ovale, foramen rotundum and sphenoidal fissure are all distinct, the latter two being approximately of the same size and both larger than the first. I could detect no separate aperture corresponding to the optic foramen.

A view of the inside of the cranium, through the foramen magnum, shows a relatively large and smooth-walled cavity, of a shape conformable to the external contour of the skull—the bones of the vault being so thin that, with the aid of a hand lens, small type can be distinctly read through them. The floor of the cranial cavity, more or less flat, though rough at its hinder part, rises in front of the basisphenoid region into a well-marked eminence, which slopes away on either side. Anterior to this again, the floor is flat. The auditory bulla seems to project internally, and shows itself as a thin-walled hollow eminence lying in front of what appears to be the petrous element of the periotic, but as I have wished to preserve the specimens intact, I cannot be certain of its exact relations, or of other details of the skull which are not accessible to examination without sections.

In the mandible the rami are relatively wide, and widest in the molar region, narrowing somewhat in front and behind. The front part of the inferior border slopes gradually upwards towards the symphysis, at which the two halves are firmly ankylosed. At about the width of a molar tooth behind the last of the series, the upper border of the jaw rises almost vertically into a strong triangular coronoid process, which has an anterior surface in the form of a laterally compressed isosceles triangle, having for its base the width of the rather wide alveolar border. This surface is vertically grooved, and posteriorly to it, the process is suddenly narrowed to a flat

plate. The condyloid process, long and sloping very much backward, barely rises to the level of the coronoid, and its articular facet, slightly compressed antero-posteriorly, stands very little above the level of the teeth. The posterior border, in its lower half, becomes expanded, and curls forward so as to form a well-marked masseteric fossa. The angle is continued into a conspicuous, considerably incurved angular process, wide and strong at its origin, but rapidly tapering to a styliform extremity. There is a large inferior dental foramen at the point of intersection of the long axes of the coronoid and angular processes, also a wide and very shallow mylo-hyoid groove. The dental foramen corresponds to the space between the last premolar and first molar.

DENTITION.

(Pl. VI. and fig. 2, Pl. VII.)

Some variation seems to exist in the number of the teeth, more particularly in the premolar region of the lower jaw. The following description is that of a specimen in which they appeared most complete, but it is not the same as that figured in the plate, where one tooth, described in the text, is absent from the lower jaw, as will be pointed out in the proper place, but, in all other essential particulars, the description will apply to any of the specimens.

Maxilla.—Within the premaxillary boundary there are three simple conical or peg-like teeth, the anterior being the largest in all measurements, and having its axis inclined inwards towards its fellow of the opposite side, while the hinder two are nearly vertical. In one dry skull, evidently that of an old specimen, there is a distinct "mark" in all three; in another and younger skull the cutting surface of the most anterior is marked by a groove. Between these incisors there is an interval nearly equal to the width of a tooth of the series.

Just behind the premaxillary suture there is a small tooth similar to, but rather smaller than, the hindermost incisor, the apex of which is inclined a little forward. This, from its position, must be a canine; its apex, also, shows a mark in the old skull. Behind this are two teeth differing considerably in size, but of a similar type, which is quite different from those that succeed them. These two, I take to be the premolars. The anterior and smaller, with its characteristics less well shown, has the anterior part of its crown elevated into a small but distinct cusp, from which the contour of the crown slopes upwards and backwards to its posterior border, where there is a very slight indication of a posterior cusp; the surface of the crown between the cusps is slightly concave. The succeeding tooth is about twice the length and breadth of that just described. It is compressed

laterally*, and has very distinct anterior and posterior cusps, the former being much the more prominent. There is an almost semi-circular valley between the two, from which a wearing surface slopes upwards on the inner and hinder face. In the closed jaw this comes in contact with the outer surface of the first molar of the mandibular set.

Four molars follow, and one description will suffice for the three anterior, which resemble one another almost exactly in size and shape; the hindermost is smaller and less complex.

Taking the first member of the series, which is that shown in Pl. VI., figs. 3—6, it is compressed antero-posteriorly and mostly so in its mid region, so that the length of the long axis of the crown, which is about twice that of the greatest width, lies exactly athwart the alveolar border. As seen externally (fig. 4), the prominent feature is a pointed, inverted triangular cusp *(a)*, of which the apex corresponds to the centre of the crown when viewed in plan. From the apex of this cusp a concavo-convex surface, showing signs of wear, trends upwards and outwards to the angles at the base, where there are two small but distinct anterior and posterior external cusps *(b* and *c)*. Between these cusps is a groove, which extends vertically to the alveolar edge. The internal face of this prominent apical cusp passes vertically upwards as a smooth rounded border to nearly the level of the palate, then spreads out internally into a concave, subtriangular, overhanging surface also showing signs of wear (figs. 5 and 6, *d)*. The concavity of this overhanging surface being due to the fact that it is bordered by a well-marked rim, which descends internally into an internal cusp *(e)*; from the apex of this, the internal contour passes upwards to the level of the palate (fig. 5, *p)* as a smooth border rounded from below upwards, and still more sharply so, from before backwards. The whole of this part of the tooth has somewhat the shape of the upper bill of a parrot, if it were much blunted and made to have a rounded end instead of a sharp point, or a better simile, perhaps, would be the peak of a military helmet. The horizontal level of this beak-shaped internal cusp is about that of the edge of the alveolar border, though, from the transversely archlike trending of the palate away from this border it stands as much below this surface as it is above the median pointed cusp.

* From the fact that this tooth is placed just where the narrow part of the pyriform area, marked out by the alveolar border, suddenly broadens into the wider end, the outer face of this tooth looks forward as well as outwards. Instead, therefore, of speaking of it as laterally compressed, it would be more correct to say that the axis of compression runs from a point outside and in front to within and behind; or, in other words, the long axis of the crown if continued forwards would strike the canine of the opposite side. *(Vide* Pl. VII., fig. 2.)

Between the molars, the interval is about that of the antero-posterior width of a member of the series, and is about the same as exists between the front molar and last premolar. The hindermost molar, smaller and simpler than the others, is also compressed antero-posteriorly; still, it shows rudiments of the details just described, the suppression of parts being most marked in the beak-shaped internal cusp, which is here only feebly represented by a ridge with a narrow worn surface.

Mandible.—There are two peg-like incisors of nearly equal size sloping forwards and showing a "mark." The apex of the next tooth, when the jaws are closed, passes just in front of the upper canine, and belongs presumably, therefore, to the same category (fig. 11, *c*). Behind this come three teeth, which I take to be premolars. (Pl. VI., figs. 1 and 11). The most anterior, which is not shown in the figures being absent in the specimen from which they were drawn, is about the size of the canine, but has its front border elevated into a rudimentary cusp, and a wearing surface sloping inwards. Then follows a minute styliform tooth, scarcely as thick as the shaft of an ordinary sewing needle, and about half the length of that just described. This is represented in fig. 11 immediately succeeding the canine (*c*). The hindermost premolar is a more developed type of the first, and much larger. Its anterior border is raised into a pointed cusp, from which a wearing surface slopes backwards and inwards, and bears it at its hinder extremity a small posterior cusp. A small wearing surface, also, shows on the outer face of the tooth.

The four true molars which follow resemble one another, but diminish in size from before backwards; a horizontal section is approximately triangular, with the base inwards (figs. 7—10). The external border, corresponding to the apex, rises into a sharp pyramidal cusp (*a*), and so also do the borders corresponding to the angles at the base (*b*, *c*), only they are less elevated and more rounded. Between these three cusps is a concave worn surface. An interval equal to half the width of a tooth of the series separates the teeth of this order; but from the obliquity with which the teeth are set in the alveoli these spaces are not seen when the jaw is viewed at right angles to its long axis, the outer and hinder border of one tooth overlapping the space intervening between this and the one behind.

The hindermost tooth of all is the fourth maxillary molar, the external cusp of the last mandibular molar passing between the fourth and the third of the maxillary series, the penultimate mandibular molar between the third and second, and so on The external cusps of the lower molars play up and down in the intervals between the large pointed cusps of the upper series, and the concave triangular surface between the three cusps of the lower

molars can be brought to play upon the under concave surface of the beak-shaped internal cusp of the upper molars, the whole thus representing a very complicated cutting and grinding apparatus. In front of the molars the arch of the mandibular teeth lies within that of the maxillary.

According to the above description, then, the dental formula is

$$\text{i}\,\tfrac{3}{2}\quad \text{c}\,\tfrac{1}{1}\quad \text{p}\,\tfrac{2}{3}\quad \text{m}\,\tfrac{4}{4} = \tfrac{10}{10},$$

but as there are certain variations in the skulls at my disposal, and in ignorance of the succession of the teeth, it is possible that this formula may require some modification.

THE HYOID BONE.

(Pl. VII., figs. 3 and 4.)

In one specimen this bone is represented by two flattened rod-like thyrohyals, osseous for the greater part, but cartilaginous at their laryngeal extremities. In front they touch in the middle line, but are not ankylosed. They are joined by a flat, semicircular and cartilaginous basihyal. In another specimen, in which the thyroid had become largely calcified, the thyrohyals were stouter and shorter in front; these were completely ankylosed, and joined by a semicircular basihyal, as in the other case.

THE VERTEBRAL COLUMN.

Atlas (Pl. VII., fig. 5, *a*) free; neural canal almost circular; transverse and spinous processes rudimentary. The articular surfaces for the occipital condyles, concave in the dorso-ventral axis, encroach somewhat on the ventral arch, which is furnished with a semilunar facet for the odontoid process of the axis. The posterior arch bears on its hinder surface a small facet for a corresponding surface on the fused spinous processes of the five ankylosed vertebræ which follow. The rudimentary transverse process carries on its posterior surface a triangular facet for a corresponding surface of the axis.

The five succeeding vertebræ are completely ankylosed, the only indication of the component vertebræ being the intervertebral foramina for the spinal nerves, of which there are four. (Pl. VII., figs. 5 and 6 *c*.) The fused bodies form a bony mass, generally much compressed dorso-ventrally, but having its lateral borders carried considerably downwards and backwards so as to convert the under surface of the mass into a wide shallow groove; in the anterior part of this groove there is a slight median ridge. The neural arches are also ankylosed, but their fused laminæ form laterally compressed plates, pointing forwards, which are much shorter in an antero-posterior direction than the fused bodies. So also are the spinous processes completely fused into a single tuberculated

prominence, which carries on its anterior surface a facet for the above-mentioned facet on the posterior arch of the atlas. The anterior border of the fused bodies is prolonged into a well-marked triangular, dorso-ventrally compressed odontoid process, of which nearly the whole of the inferior surface is marked with an articulating surface for the atlas. This anterior border carries, also, relatively large triangular or pyriform articular facets for the atlas, which extend nearly up to the base of the odontoid process.

The transverse processes of the ankylosed vertebræ are represented by a minute but distinct conical projection (omitted in fig. 5), which corresponds, in position, with the fifth and sixth, or fourth, fifth and sixth vertebræ, but it apparently contains, also, the fused representatives of all five. From this, a slender bony bar passes to a point about the middle of the lateral edge of the fused bodies, thus forming a sort of vertebrarterial canal. Posteriorly the fused mass presents a broad shallow U-shaped articular surface, which, in its central part, articulates with the body of the next vertebra, and by the lateral parts with the first rib.

The seventh vertebra (Pl. VII., figs. 5, 6 and 8) has a dorso-ventrally compressed body, which articulates with the bodies of the vertebræ in front and behind. Its neural arch is slender and ring-like, without any spinous process. The transverse process is well marked, and bears anterior articulating surfaces on the dorsal surface of its root, which face upwards. The posterior zygapophyses have their articular surfaces looking downwards.

In the eighth vertebra (Pl. VII., figs. 6 and 8) the body is similarly compressed dorso-ventrally. The spinous process is very long, and both it and the laminæ of the neural arch slope much backwards, so that a wide gap is left between this and the neural arch of the preceding vertebra, which inclines forwards. The transverse process, not so prominent as in the seventh vertebra, carries at its root an anterior articular surface which looks upwards. On its under surface, looking forwards and a little outwards, and extending inwards, so as to be continuous with the posterior articular surface of the body, is a surface for articulation with the first rib. Posterior zygapophyses, rudimentary, with their articular surfaces lying almost entirely on the internal surfaces of the root of the laminæ and, from the obliquity of these, facing much downwards as well as inwards. At the posterior part of the lateral border of the body, and continuous with its posterior articular surface, is a facet which, with a corresponding facet on the body of the next vertebra, constitutes the articulation for the head of the second rib.

Reckoning the vertebra, just described, as the first of the

thoracic series, fourteen follow which bear ribs; these bear a general resemblance to the eighth, with the following modifications.

There is a gradual diminution in length of the spinous processes, and those of the tenth to the thirteenth are the most backwardly inclined; up to this latter point they are slender and rod-like, or rather bayonet-shaped, but at about the fifteenth they begin to be compressed laterally, as well as to become shorter, wider and more vertical. The spinous process of the last thoracic is nearly as wide as high.

Their transverse processes are of uniform length till the eighteenth is reached, then they become progressively shorter, till at the twenty-second, the process is represented only by a ridge. That of the eighteenth is the last, to which a rib is fairly articulated, though in the case of the rib-bearing vertebræ which follow, there are ligamentous bands which attach the neck of the rib to the transverse process. Two contiguous vertebræ provide the articular surface for the heads of all the ribs, except the first, which has a more extensive articulation that will be particularly described, and the last two or three. Each vertebra supplies an equal area in the case of the second and third rib, but, in passing backwards, the articulating surface gradually trespasses more and more on the hindermost of the two contiguous vertebræ till, in the last two or three, it is furnished by the body of a single bone.

In the twenty-first or penultimate thoracic vertebra, the posterior zygapophysis becomes more distinctly marked, and the posterior articular surface is on it, rather than on the inside of the laminæ, as in the case of the vertebræ preceding, from the eighth to the twentieth. This surface is also more markedly convex instead of nearly flat, and looks downwards and outwards, instead of nearly directly inwards; the pair fit into two very concave depressions on the anterior zygapophyses of the last thoracic, which almost meet in the middle line. A similar description applies to the last of the thoracic series.

Metapophyses are distinct on the penultimate thoracic, and become still more marked on the last. Insignificant rudiments of paired hypopophyses, also, appear on the posterior part of the body of the last one of the series.

Four lumbar vertebræ follow (Pl. VII., fig. 9) having the general type of the last thoracic. Transverse processes, small on the first, become larger in the remainder; in the last two they are long, point forward, and have their extremities somewhat hooked ventrally. They spring from the junction of the neural arch with the bodies. The metapophyses, which made their appearance in the hindermost thoracic, become here increasingly developed in

serial line. The second lumbar carries a pair of ridge-like hypopophyses, but these are quite rudimentary on the vertebræ both in front and behind; and are not distinguishable on the fourth.

Reckoning as sacral vertebræ all that are ankylosed, these are six in number. The fusion is complete, but the number of the constituent vertebræ is revealed by transverse ridges on their ventral surface at the junctions of the bodies, as also by the foramina of exit of the spinal nerves.

The sacrum.—Pl. IX., figs 1—4. The conspicuous feature of the sacrum is an enormous development and fusion of the metapophyses of the constituent vertebræ, which, thus expanded and fused, form a roof, which overhangs the pelvis (figs. 1, 2 and 4 *mm*). This is widest anteriorly, where also it can be seen to be serially continuous with the metapophyses of the lumbar vertebræ; it then narrows slightly, and posteriorly, it widens into two diverging processes (fig. 2). With the under surfaces of the anterior and posterior extremities of this overhanging metapophysial roof are fused the ilia and ischia respectively.

The spinous processes (fig. 2 *s*) are also ankylosed, forming, in front, a keel-like ridge, but behind, the superior edge of this ridge expands laterally into a wide lamina, which, extending outwards, meets, or nearly meets, the fused metapophyses and thus forms either a completely closed canal, or, in the parts where the two elements have not completely met, a deep groove. Into this canal or groove, as the case may be, open large foramina for the posterior divisions of the spinal nerves. The transverse process of the first of the sacral vertebræ is like that of the last lumbar, but stouter and points rather more downwards. The remainder of these elements are fused into an arched lamina (fig. 1 *tr*) which is ankylosed with the ilium in front and the ischium behind. This lamina is perforated by large foramina for the inferior divisions of the spinal nerves.

The first sacral vertebra bears anterior zygapophyses with concave facets for articulation with the posterior zygapophyses of the last lumbar, and similarly, there are small zygapophysial processes with facets for the first of the caudal series (fig. 3 *pz*.).

The Tail.—The caudal vertebræ are twelve in number, the tenth and eleventh being nothing more than rounded nodules, and the last a plano-convex plate (Pl. V., figs. 1 and 2).

The bodies, of the first four or five, are rather elongated; the spinous process broad and distinct on the first two or three, subsequently diminishes in size to the fifth or sixth of the series, where it disappears as a distinct median process, and is afterwards represented by a minute tubercle on each side of the mid-line.

The transverse processes are flat and rather broad in the first

two, then narrow, but become longer in the next two. So far, they project horizontally, but the transverse process of the fifth points considerably downwards, and has its extremity tuberculated and hooked downwards and inwards, so that it almost meets the chevron bones. The same general features prevail in the sixth, and, in the subsequent caudal vertebræ, where the process exists, it becomes gradually shorter, and terminates in a rough tuberous knob.

There are hypopophyses fused with the bodies of the second and third caudal vertebræ; and, abutting on the junction between the third and fourth is a distinct and separate chevron bone, which is perforated by a canal. These exist at each subsequent vertebral junction, being very largely developed about the middle of the caudal series, and their largely expanded ventral surfaces are rough from the presence of grooves and ridges running in the direction of the long axis of the body. The chevron bones exist quite to the end of the tail, but, corresponding to the last three or four inter-vertebral spaces, they are little more than rounded nodules.

THE RIBS.

Pl. V., figs. 1 and 2. Pl. VII., figs. 5, 6, and 8.

There are fifteen ribs, of which seven are articulated to the sternum.

The first is a remarkable bone. (Pl. VII., figs. 5, 6 and 8). Very short and strong, it forms a powerful buttress for the sternum; it is very irregular in shape, being in general terms expanded at each extremity and constricted in the middle, the constriction being due to a deep notch on the anterior border; or, the rib might be described as being very abruptly bent on itself in such a way that the sternal end points both forwards and inwards. Its large, expanded and irregularly trihedral head is directly articulated with the posterior surface of the laterally-expanded and ventrally-projecting mass of the fused cervical group, which, at this point, represents the sixth. It is also articulated with the transverse process of the eighth, of which the articulating surface encroaches slightly on the body. There is also ligamentous connection with the body and transverse process of the seventh vertebra, the rib thus being very firmly fixed to a wide extent of attachment. The sternal extremity, bent forwards and inwards, as above mentioned, is flattened and very wide, and joins the lateral edge of the presternum, along its whole length, to its junction with the first segment of the mesosternum. (Pl. VII., figs. 5 and 6.) Sometimes there is complete ankylosis at this articulation, the position of the junction being shown by a bony ridge, and in one specimen, complete ankylosis has taken place on one side only.

The fourteen ribs which follow are all slender and rod-like. Besides the first, the sternal attachment of which has been described, six other ribs join the sternum by means of sternal ribs, which meet the points of junction of the segments of the mesosternum, the union of the second rib being at the meeting of the first and second segment, and so on.

The costal cartilage of each succeeding rib, does not directly meet the sternum, but joins that of its predecessor.

The sternal ribs, in the case of the fourth, fifth, sixth and seventh, are not completely ossified in their outer segments; thus, there intervenes between the end of the vertebral rib and the ossified part of the sternal rib adjacent to the sternum, an intermediate cartilaginous segment. (Pl. VII., fig. 5 *xxxx*). These cartilaginous parts of the sternal ribs are not, however, completely segmented off from the inner ossified parts; the failure in ossification is gradual, and the ossification, complete in the sternal extremity, becomes less and less complete in the outer segment, till eventually cartilage only stands in place of bone. The junction between the cartilaginous segment of the sternal rib and the vertebral rib is quite abrupt.

The heads of the ribs, other than that of the first, are articulated with the bodies of the vertebræ, as mentioned in the description of the spinal column; thus the head of the second rib abuts on the bodies of the eighth and ninth vertebræ, and so on. Following the first, the part in the other ribs corresponding to the tubercle is attached to the transverse processes by ligamentous union, which is close and intricate as far as the eleventh; in the remainder, the union is less close, as the transverse processes gradually diminish in prominence. As already described, the transverse process of the eighth vertebra is distinctly facetted for part of the articulation of the head of the first rib; that of the ninth is only imperfectly so, but beyond this no definite facets are evident, but merely roughened surfaces for the ligaments.

THE STERNUM.

(Pl. VII., figs. 5, 6, 7 and 8).

The sternum consists of a presternum, a mesosternum of six segments, and a ziphisternum. The presternum is remarkable on account of its strong and prominent keel, which projects downwards and forwards to an extent which is greater than its length in a fore and aft direction (fig. 6 *f*). The lateral wings, which are slightly concave on each side of the keel, articulate (or ankylose) with the first rib, as described under that head, the posterior end of the junction coming right up to, or even encroaching upon the concave articular facet on its hinder face for the first segment of the mesosternum. The inner, or superior, surface of

the presternum is smooth and concave from side to side; behind, it rises in the mid-line into a small eminence, which supplies most of the before-mentioned facet for the mesosternum, the remainder being furnished by the root of the keel.

The six mesosternal segments (fig. 6 *i*) are compressed from side to side, and slightly expanded at each end, where they articulate with one another.

The first two are of equal length, and each is nearly as long as the presternum, but the four segments which succeed are only about half as long as these. The sternal ribs abut on the junctions of the mesosternal segments, that of the second meeting the points of contact of the first and second. In the case of the second, third and fourth the abutment is directly at the side of the mesosternal junction ; while in the case of the fifth, sixth and seventh the ends of the sternal ribs lie ventral to the mesosternum, and almost meet one another in this position.

The ziphisternum (fig. 7) is a slender bony rod nearly as long as the first segment of the mesosternum, having for its terminal portion a flat cartilaginous expansion.

THE SHOULDER GIRDLE.

(Pl. VIII., figs. 1, 1a, 1b and 3b).

The scapula is narrow for its inferior, or, in its natural position in the animal for its anterior, two-thirds, but wide superiorly (or posteriorly), owing to the rapid divergence of the glenoid and coracoid borders at their posterior ends. The suprascapular border is thus of considerable extent, and the angles at its junction with the glenoid and coracoid borders, respectively, form prominent hook-like process which turn forwards and inwards (fig. 1).

The mesoscapular spine is well developed (fig. 1 *s*). Rising from almost the whole length of the bone, it is carried forward to form a long acromial process, leaving a deep notch between this and the scapular neck ; it is besides much inflected, so as to overhang the postscapular fossa.

The postscapular fossa, much wider than the prescapular, gives origin to a well-developed second spine which lies nearer to the glenoid border than to the mesoscapular spine. Near the glenoid cavity it runs almost flush with the glenoid border—indeed, at that part one might describe the glenoid border itself as being turned up to form the second spine. (fig. 1 *gb. ss).* The free edge of this second spine in parts so nearly approaches the edge of the overhanging mesoscapular spine as almost to convert the groove between them into a tube ; as it is, it is an exceedingly deep canal (figs. 1., 1a., 1b.) Approaching the scapular neck, this second spine still further rises into a marked flat process, (fig. 1 *p*) which

gives attachment to a ligament passing to the hinder border of the acromion. Between this process *(p)* and the glenoid cavity is the neck.

The coracoid border terminates in a very small coracoid process (fig. 3b *c*) which blends with the margin of the glenoid fossa, and in fact may be said to share in the formation of the articular surface. It gives attachment to a coraco-acromial ligament. The subscapular fossa is slightly concave from the glenoid to the coracoid border.

The glenoid surface is subtriangular in shape, and concave.

A considerably elongated mesoscapular segment is connected with the acromial process, and continues this forwards and inwards (figs. 1, 3b *m.s.s.*). To its bevelled end is attached the clavicle.

The clavicle (figs. 1, 3b *cl.*) is a very slender, curved, styliform bone, which ends in an enlarged sternal extremity. This, however, does not reach the sternum, but it is continued onwards as a ligament about half a centimetre in length, which is attached to the anterior border of the keel of the manubrium sterni.

THE ARM AND FOREARM.

(Pl. VIII., figs. 2—5a).

The humerus (figs. 2—3b) is a stout, strong bone, with its inferior extremity very much widened from the great extension inwards of the internal epicondyle. The head is rounded, and there are well-marked external and internal tuberosities. The ectocondylar and deltoid ridges are well-marked, and the musculospiral groove wide and deep. No supratrochlear or supracondylar foramen. The trochlear surface is almost completely divided by a deep notch into two portions, of which that for the radius is the larger. The internal epicondyle terminates in a hook-like process.

The ulna (figs. 4, 5) is remarkable for its long and much incurved olecranon process, the length of the process being nearly as great as that of the shaft. The shaft, wide above, from before backwards, and grooved on its hinder surface, tapers to a slender rod below, which curves a little outwards and backwards, and has a small blunt styloid process. In the natural position, the ulna lies behind the radius for its whole length. The surface of articulation for the humerus is deeply concave from above downwards, and its inferior lip constitutes a coronoid process. The superior lip is also prominent. Externally is a concave surface, for the head of the radius, which is bounded superiorly by a prominent lip.

The radius is about half the length of the ulna, including the olecranon. Its head is considerably expanded, and so, also, is its inferior extremity, from which proceeds a styloid process. Its articulation with the ulna and with the humerus has

been sufficiently described. Below, the radius and ulna together articulate with the lunar, cuneiform, and a large bone which will be described as the scapho-carpal, the radius taking the greatest share in the formation of the joint.

THE MANUS.

The manus (Pl. VIII., figs. 5 and 5a) is so distorted, and presents so many departures from the typical structure, that I cannot, with my limited experience in comparative osteology, be quite certain of the homologies of the different parts. Its features are best seen from the palmar surface. Figure 5 represents that of the left side enlarged to two and a half times, and, in order that the details of the structure may be better shown, a large palmar sesamoid bone (fig. 5a) has been removed; the relations of this will be better understood when the other parts have been described. The central figure and most conspicuous feature of the hand is a large irregular bone which extends almost completely across the carpus, and which has its palmar surface raised somewhat above the level of the remaining bones. It is indicated in fig. 5 by *sc*, as well as by the two crosses nearest the radial side; a foramen pierces it from above downwards, the position of which is indicated by the curved arrow. Articulating with the radius on its extreme radial side, it occupies the place of the scaphoid, but from its relation to the digits, with all of which it articulates, it seems to represent also the carpalia (I—V), and I will therefore, for the sake of convenience in description, term it provisionally the scapho-carpal. Lying between it and the radius, and visible only from the dorsal side, is a small bone, not shown in the figure, about the size of a pin's head, which I take to be a diminutive lunar; succeeding this on the ulnar side, and articulating with the ulna, is a semilunar-shaped bone, which is doubtless the cuneiform *(cu)*. The scapho-carpal has on its inferior aspect, and towards the palmar surface, a small concave facet, which carries a metacarpal-like bone (fig. 5 *r*). This supports two phalanges of the second digit, the more distal terminating in a long narrow claw. To the same metacarpal, as well as to the base of the proximal of its two phalanges, is attached, by ligamentous connection, the slender representative of the pollex, which also is composed of two segments, the terminal one ending in a claw. These are the two digits which are, as has been described, folded over towards the palmar surface of the manus, and form the inner of the two rows which bound the palmar cleft. Immediately to to the dorsal side of the facet for the bone described above as the metacarpal *(r)* common to the second digit and pollex is another for, what appears obviously, the metacarpal of the third digit *(s* and *s)*;

this is articulated to, and carries, a single phalanx, which is fused with the long claw *(c)*. Still more to the ulnar side of the scapho-carpal, articulating with it and projecting beyond it towards the ulnar side, is a bone *(t)* very wide in a radio-ulnar direction, which seems a greatly widened metacarpal, for it is articulated to, and carries, the large triangular claw of the fourth digit *(d)*.

If, therefore, I am correct in these homologies, each of the third and fourth digits possess one phalanx only, with which is firmly fused the corresponding great claw.

Articulating with that described as the cuneiform is an elongated bone, pointing superiorly, which appears to be an elongated pisiform (fig. 5 *p*). Parallel to this, and lying so much to its dorsal side that it is partially concealed by the pisiform in the palmar view represented in the figure, is an elongated metacarpal-like bone (fig. 5 *u*), which, by its proximal extremity, articulates with the scapho-carpal. This I take to be the metacarpal of the fifth digit, and it together with the pisiform support at their distal extremities a broad stumpy nail (*e*).

Lying on the palmar surface of the manus is a considerable bone before alluded to, which appears to be a palmar sesamoid. As has been stated, it is not shown in position, for it would have obscured other parts, but it is represented separately, with its palmar aspect turned towards the observer (fig. 5a). By its forked distal extremity it articulates with two facets on the large claw-bearing phalanges representing the third and fourth digits. These are marked *y.y* in fig. 5, and if, in the sketch, they appear too wide apart to correspond with the forks of the sesamoid bone, it is because the two digits have been somewhat separated to allow of better representation. By the proximal extremity this sesamoid articulates with a surface having three facets *(x.x.x)*, two of which are furnished by the scapho-carpal, and one by the pisiform. From its position it forms a sort of buttress or prop for the third and fourth digits, and in the same way the pisiform forms a support for the fifth.

THE PELVIC GIRDLE.

(Pl. IX., figs. 1, 2, 3 and 4.)

The pelvis lies very obliquely, nearly approximating to the horizontal. There is no indication of separation between its constituent bones.

The ilium is rod-like and trihedral in its middle part, with its faces looking downwards and outwards, downwards and inwards, and nearly directly upwards respectively. Anteriorly these surfaces gradually widen, and eventually the bone fuses with the body, metapophysial and transverse processes of the first, with the body and transverse process of the second, and with the transverse

process, only, of the third sacral vertebra. Posteriorly, the narrow rod-like portion of the ilium widens towards the acetabulum. The pubic elements come together at a wide symphysis, and are completely ankylosed. The posterior edge of the pubic and the ischial portion of the pelvis diverge as they ascend, and the latter fuses with the metapophyses and transverse processes of the two last sacral vertebræ. The posterior outlet of the pelvis has a markedly triangular outline (fig. 4). The acetabulum is circular and deep, and has a wide cotyloid notch posteriorly ; it is imperforate, but its internal wall is very thin. A round ligament exists.

The obturator foramen, nearly circular, is situated below and behind the acetabulum, and is about one-third of its diameter.

MARSUPIAL BONES.

These are two very small osseous nodules, slightly divergent anteriorly, which lie in the tendon of the external oblique muscles of the abdomen, close to their attachment to the anterior border of the pubic symphysis. They are scarcely visible without a lens, and are consequently liable to over-looked.

THE THIGH AND LEG.

(Pl. VIII., figs. 6 and 7.)

In the femur (fig. 6), the head is approximately spherical, but tapers somewhat to a blunt conical point ; it is marked by a small depression for the round ligament. The neck is short and constricted, standing out almost at right angles to the shaft, and there is a small but conspicuous tubercle at the junction of the front border of the neck with the shaft.

The great trochanter is much compressed antero-posteriorly, and very broad from above downwards. The lesser trochanter is a small conical process pointing inwards and backwards, situated at the junction of the inferior and posterior border of the neck with the shaft (fig. 6 *l.t*). The latter is somewhat flattened from before backwards, and widens into an inferior extremity, which presents two condyles, separated in the posterior half of the articular surface by a deep and narrow notch. Besides articulating with the tibia a large portion of this articular surface, by its superior and front part, articulates with the large patella and the external condyle, on its outer side, also articulates directly with the fibula by a surface which is continuous with that for the tibia and patella.

The shaft of the tibia (fig. 7) is very broad, and expanded in an antero-posterior direction in the upper half, this being due to the projection forwards of the anterior border as a prominent ridge. The bone narrows gradually to the junction of the middle and inferior third where it becomes subtriangular in section. The

lateral surfaces of the expanded part are slightly concave, and the upper articular surface is much elongated from before backwards and deeply grooved in its front half for the patella. In the posterior part there is an articular surface separated into two facets by a notch. The inner, and larger, is concave ; the outer, and smaller, is convex, and is placed upon an outwardly projecting process. Both of these are for the femur. On the outer and under surface of the projecting process, just mentioned, and continuous with that for the femur, is a small flat facet for the fibula.

The inferior extremity articulates with the fibula, and is prolonged into an internal malleolus.

The shaft of the fibula (fig. 7) is slender, lying so far behind the tibia, as to stand almost clear of its posterior border. Its upper extremity is expanded into two flattened, and almost hook-like processes, which project fore and aft, and, on the inner surface of the bone, at the junction of the shaft with these expansions, is an articular facet looking upwards and inwards, which is partly for the tibia and partly for the femur. Of the expanded processes, the anterior comes to a point, but the posterior terminates behind in a broad slightly inflected border. Midway between the two and immediately above the facet for the superior tibio-fibular articulation is a large foramen *(o)*.

Below, the shaft expands into an inferior extremity, which is prolonged into an external malleolus, and the tibia and fibula together furnish an articulation, concave from side to side, for the astragalus.

The patella (fig. 7 *p*) is relatively very large and irregular, and generally flattened from side to side for the anterior two-thirds ; in the remainder it is somewhat laterally expanded. On its posterior face it has a large flat facet, which plays upon the inferior femoral articulation, as described under that bone. The inferior border is brought to a sharp ridge, which fits into the groove, described as existing, upon the front part of the head of the tibia. The outer surface is somewhat concave from before backwards ; the inner rough.

THE PES.

(Pl. VIII., figs. 8, 8a, 8b.)

The pes departs so much less from the normal type than the manus, that I need only confine myself to a description of the parts which present peculiarities.

The calcaneum extends considerably backwards as a long bony spur (fig. 8 *ca*). The scaphoid (*sc*), deeply concave towards the heel, articulates in front with a considerable internal and small middle cuneiform (*ic* and *mc*). These two carry respectively the hallux and second digit. There is a large irregular cuboid (*cu*), which

may represent also the external cuneiform ; it has articulating with it the second as well as the three outer digits.

The digits, five in number, all possess the normal number of bones; and their terminal phalanges bear claws, which have been sufficiently described in a previous paragraph.

The fifth metatarsal however is peculiar, and deserves special mention (fig. 8a). It is immensely expanded towards the plantar aspect, and projects also towards the heel as a flat and blunt unciform process, the hinder extremity of this projection overlaps the calcaneum for nearly half its length. On the inner side of the pes is a large flattened sesamoid bone (fig. 8b), which is attached to the foot by ligamentous union ; this also projects sole-wards after the manner of a bilge-keel. This bone, together with the similar plantar projection of the expanded fifth metacarpal, converts the sole into a trough-like groove.

THE SENSE ORGANS.

THE EYE.

No trace of this organ is visible externally, or on removal of the integument, but on reflecting the temporalis muscle it shows as a nearly circular, black lens-like disc on the inner surface of the anterior part of the muscle; it lies directly on the periosteum of the lachrymal bone at a point immediately behind the exact origin of the upper margin of the zygomatic arch, which here begins abruptly with a sharp upper edge and makes a sharp curve downwards and backwards. (Pl. VI., fig. 1.) No structure resembling an optic nerve was visible with the dissecting lens, though, on reflecting the pigment spot from its bed, fine filaments, apparently of connective tissue, were observable stretching between it and the periosteum.

The diameter of the pigmented disc is about ·5 mm. Sections made through it with the Cambridge rocking microtome, show it to be composed of a mass of pigment enclosed in a capsule of fibrous tissue resembling that of ordinary sclerotic, and its innermost layers similarly contain pigment. The inner pigment is accumulated into a large opaque mass, which occupies the greater part of the interior of the capsule, particularly the peripheral region and that believed to be the anterior. In those parts where the accumulation is less dense, or where the pigment is absent, viz., in the posterior and axial parts, the mass can be seen to be made up of small granules of varying size, either darkly pigmented, or yellow and highly refracting. In these situations can be distinguished, also, numerous nuclei, staining readily with borax-carmine solution, which appear to be those of epithelium-like cells.

Closely adjacent to the fibrous capsule, and covering it to a considerable extent, is a glandular structure of the type of a serous salivary gland, which has, however, certain peculiarities of its own.

In those sections in which the effort was made, and I believe successful, to have them running truly in an antero-posterior direction, there is to be seen evidence of the existence of a relatively large cavity, sac or duct, situated immediately in front of that part of the fibrous capsule, which would correspond to the cornea in the normal eye; in fact the front part of the capsule forms the hinder boundary of the cavity in question. This showed clear indications of an epithelial lining which thus appears to cover the surface of the front part of the capsule in the same way as the normal cornea is covered by its anterior epithilium. The antero-posterior sections passing through the central regions of the disc show the contour of the fibrous envelope to be pyriform, and the posterior and smaller end is continued backwards as a band or bundle of connective tissue, in which, however, no trace of nerve structure can be distinguished.

It should be noted that the sections were made from eyes taken from a specimen which was not in good condition, and also, that the smallness of the object made it difficult to be quite sure that the sections ran truly in the desired directions. Thus, without further investigation, I cannot be absolutely certain of its relations, or of the morphological value of its constituent parts So far, however, I believe my description is correct.

THE EAR.

From the aperture of the ear, the external features of which have already been described, a fibrous or fibro-cartilaginous tube bounds the meatus to the auditory aperture of the bony skull. As I was unwilling to damage any of the limited number of perfect skulls at that time in my possession, I have as yet made no examination of the internal ear.

SALIVARY GLANDS.

(Pl. VIII., fig. 9.)

Below the meatus externus is a large flattened parotid gland, and to the inside of this, overlapping its inner edge and extending inwards so as nearly to meet its fellow on the opposite side, is an equally large flattened submaxillary, showing five or six well-marked lobes. The two glands of both sides form an almost continuous broad band of gland tissue stretching from one meatus to the other.

MUSCULAR SYSTEM.

I have not been able to devote any of the specimens as yet examined to a detailed examination of the muscular system, nor indeed were any, except one which I have been anxious to preserve, as nearly as possible, intact for future reference, in a very suitable condition for a careful investigation of the soft parts; but generally speaking the muscular system is very well developed, especially on the limbs, pectoral, dorsal and caudal regions. A large mass of nuchal muscles, shown by the dotted line *(l)* in Pl. V., fig. 1, passes from the trunk and reaches to the summit of the occipital region for insertion into the triple ridge described on the posterior part of the vertex of the skull. This muscular mass contributes materially to the obliteration of the neck that has been alluded to.

URINARY AND GENERATIVE ORGANS.

(Pl. IX., figs. 5 and 6.)

The long, straight and wide rectum, lying in the middle line of the body, opens into a cloaca, which receives, also, the genito-urinary products. The anal aperture of this is surrounded with long straight hairs. The urinary bladder, considerably elongated and narrowing from the fundus, lies on, and ventral to, the rectum, and into its posterior narrow extremity the ureters and vasa deferentia open close together, but the former are dorsal to the latter. From the bladder the first portion of the urethra passes posteriorly as a straight tube of considerable length, and then enters the posterior end of the penis, in which, with ordinary dissection, I was unable to distinguish separate spongy and cavernous portions. This organ shows at its root two divergent bulbs, which, coalescing into a single cylindrical body, passes backwards, lying on, and closely adherent to, the ventral surface of the rectal wall. Posteriorly, the penis terminates in a single-pointed extremity, which pierces, as it were, the cloaca, and when this is laid open the tip just appears lying retracted within a recess in its wall, which thus forms for it a sort of preputial sheath (fig. 6); out of this recess the organ can be drawn considerably. On the dorsal aspect of the point of the penis is the slit-like anterior orifice of the urethra, which thus perforates the whole length of the organ.

The testes are oval bodies, which lie between the muscular planes of the abdomen in a position corresponding to the anterior edge of the pubic symphysis; they are therefore prepenial. In the specimens before me there is no trace of an external scrotum, and the organ can scarcely be felt by careful examination from the outside of the body. In the notes forwarded to me by Mr.

Benham, however, it was stated that "the testes of the male are like those of a cat," which would seem to indicate that they are a prominent external feature. There is apparently a tunica vaginalis, also an epididymis closely applied to the body of the testis, from which the vas deferens runs a nearly straight course to the point indicated in the description of the bladder; both it and the spermatic artery pass through a ring-like aperture in the peritoneum lining the abdominal cavity.

The kidneys are suboval, with smooth surface, and close to them, on the inner side, lie the adrenals of considerable relative size; the course of the ureters is sufficiently shown in fig. 5, and their termination in the bladder has already been described.

On each side of the terminal part of the cloaca, lying embedded in the surrounding connective tissue, is an oval gland, nearly as large as the testis, from which three tube-like structures pass towards the cloaca. Whether any one of these is a duct I am unable to say, nor could I with dissection with an ordinary lens detect an opening within the cloaca, but they all passed towards it, as shown in fig. 5.

Marsupium.—In Mr. Benham's notes he described the female as possessing a pouch which opens backwards, and, in my own preliminary description, I have described such as existing in the following terms :—"About 15 mm. in front of the vent there is a pouch in the integument about four mm. wide, with the opening directed backwards, and having a depth in a forward direction of from four to five mm. The surface of this pouch is devoid of hair, but the bare area is surrounded by thick fawn-coloured fur, with a slightly reddish tint." See Plate V., fig. 3. The condition of this specimen, which was apparently the only female I had then received, made all observations in reference to soft parts of doubtful value.

I am now, however, able to confirm these statements by an examination of the specimens recently obtained, for, four of these are undoubtedly females. Two possess a pouch, which is so well developed as to suggest that it has recently been occupied, and in two the organ is small and rudimentary. In that in which the pouch is largest, a groove in the integument, bounded by two well-marked pillars, begins just in front of the anus, and leads uninterruptedly forward into a *cul-de-sac*, which readily admits a glass rod 5 mm. in diameter. This pouch terminates at a point about 15 mm. in front of the anal orifice, and it thus opens backwards. Sparsely scattered over the integument, lining the interior of the pouch, are reddish hairs; but examination with a hand lens did not enable me to detect any nipple or orifice. A narrow margin of somewhat bare integument

immediately surrounds the pouch, but outside of this the fur is especially dense and of a darkish red colour.

In the two specimens in which the pouch is rudimentary, a similar but much narrower groove leads forwards from the anus, and ends in a constricted *cul-de-sac*, which barely admits the end of a darning needle. The same area of dense red fur surrounds the region.

All four females are from one to two cm. shorter than the largest male in my possession; but, on the other hand, both the males of the last series are no larger than the average size of the four females.

Food:—The intestines of those specimens, the condition of which permitted an examination of the contents to be made, contained the debris of insects, amongst which those of ants were conspicuously recognisable.

In the preceding description of some of the organs no attempt has been made to treat the subject exhaustively. The condition of all the earlier specimens, except one, which I have desired to keep as far as possible unmutilated for future reference, rendered this difficult of accomplishment, and I have been satisfied in making out as far as I could such details as were most obvious, or of chief importance, in determining the affinities of the animal. Unfortunately, no information whatever can be given as to the brain, which, as might be expected under the circumstances, was, in every case, in a state which rendered an examination quite hopeless. As regards the later specimens, though I can plainly perceive that they are not in first-class condition, they yet appear to be much superior to all, except one, of the former series. These I have only examined superficially.

CONCLUDING REMARKS.

For the considerable delay that has elapsed since the publication in the Transactions of this Society, and subsequently in the correspondence columns of "*Nature*," of some preliminary notes on the structure of this new marsupial, I must seek the indulgent consideration of naturalists, both in Australia and in England, who have, not unnaturally, been looking forward to a more complete description of a new animal of the greatest possible interest from many points of view. No one has regretted the delay more than I have. In extenuation, I must be allowed to say that scientific workers in the old world may not quite realize the difficulties under which some of their colleagues in the new have to labour. Many of these, primarily teachers, are not only, without adequate assist-

ance, overburdened with routine courses of lectures of inordinate length, but have also thrown upon them large administrative duties in their self-imposed efforts to found and sustain, on a creditable footing, scientific societies and institutions in countries where, as yet, science meets with little general support or sympathy, and where its pursuit is often looked upon as an amiable craze. Lastly, the imperfections and deficiencies of our Libraries and Museums—though these are rapidly improving—still leave much to be desired in the way of literature for reference and material for comparison.

Under all these unfavourable circumstances, which perhaps are to be expected in a young community, it is not surprising that those of us who are teachers of science in Australia have hitherto suffered the humiliation of seeing so much of the work on purely Australian subjects done elsewhere. The scientific prizes of the investigator, of first importance, have not unusually been, so to speak, snatched from under his very eyes.

Such being the case, in spite of a strong appeal to have the work, involved in the present investigation, done in England, I was anxious that it should, if possible, be retained in the colony in which the discovery was made.

It was possible to desire this and at the same time to admit freely that the work might have been better done if undertaken by those whose vastly superior competence must be at once acknowledged. As an additional reason for this wish, of a somewhat personal character, it is not, perhaps, out of place to say that, being, since the discovery of the animal, either a member of the Council, or President, of this Society, a feeling of loyalty towards both it and the colony, strongly suggested that I should, by the destination of the paper, gain for both whatever scientific credit might accrue from its local publication. The delay would not have been so great had I not felt bound to avail myself of very favourable opportunities that presented themselves, of visiting remote parts of New Zealand and the little known regions of Central Australia, during two successive long vacations, during which periods I have leisure to undertake independent work satisfactorily. Indeed, as previously stated, the latter journey of over 2,000 miles, of which over 1,200 had to be performed by driving, or riding on horseback or on camels, was undertaken largely with the hope of obtaining a further supply of specimens of this animal. I think I may fairly offer the sucessful result of the journey, in this respect, as an adequate compensation for some, at least, of the delay, for which I am responsible, as I shall now be able to submit examples to the examination of more competent

zoologists than myself, and thus to afford an opportunity of inspection by those interested in the discovery.

As has already been stated, the generic name originally proposed was Psammoryctes (sand-burrower, Gr.), but during my absence in North Australia I was made aware through information emanating from my old friend and teacher, Professor Newton, of Cambridge, whom in this matter, as well as in many others, I have to thank for acts of kindly interest and encouragement, that this name had already been appropriated for another group of animals, viz., by Pöppig in 1836 for a genus of mammals, and again by Vejdovsky, in the Zeitschrift fur Wissenschaftliche Zoologie for 1876, for a genus of worms. Psammorycter, which is practically the same word, was used by Blanchard in 1840 for a genus of Diptera. Professor Newton suggested Notoryctes as being appropriate, in view of its Australian habitat, and this name is, I think, preferable to Neoryctes, which had been previously proposed by Dr. Sclater. Though I regret extremely that the original name is preoccupied, as its sand-burrowing habits are so eminently the characteristic feature of its life, I think the new one will be regarded as satisfactory. As to the specific name, the extremely rudimentary condition of its eyes at once recommended it as suitable.

In view of the remarkable peculiarities of structure presented by the sub-class Marsupialia, and of the fact that we find amongst it analogous representatives of most of the orders of Mammalia, it has seemed not a little remarkable that hitherto no marsupial has been found with mole-like habits. In Notoryctes we have such a form developed to an extreme degree, and I regret that the exigencies of publication and the desire not to increase the delay which has already occurred in the preparation of this paper, together with the disadvantages, under which we labour in our work, to which I have alluded, make it undesirable for me now to attempt to enter into the many questions of interest, which are suggested by the structure of so singular a type. Certain osteological comparisons with existing forms are at once obvious, but I believe these may also be made, in respect of the dentition, with that of some of the Mesozoic mammals, to which, unfortunately, I can only refer by plates. Into these important questions, however, I cannot, with the time and means at my disposal, now attempt, even perfunctorily, to enter; and I can only hope that the description, so far as I have given it, will enable others to form their own conclusions.

In a subsequent paper I hope to embody the results of a more detailed examination of the organs, for which I hope the specimens now at my disposal will provide sufficient material in a suitable condition.

EXPLANATION OF PLATE II.

FIGURES.

1. *Notoryctes typhlops*. Side view *(nat. size)*. The small orifice at the posterior part of the head is the meatus auditorius externus, from which the fur has been brushed aside for better representation.

2. Foreshortened view of the snout and mouth. The line *a* points to the nostrils and *b* to the mouth.

R.C.F. del

H.B. lith.

EXPLANATION OF PLATE III.

Notoryctes typhlops. Ventral view *(nat. size)*.

J. L. C. W. del.

H.B. lith.

EXPLANATION OF PLATE IV.

FIGURES.

1. *Notoryctes typhlops*. Right manus, external aspect (x 2).

2. " " " " internal aspect as seen from a little in front (x 2).

3. " " " " external aspect as seen from a little behind (x 2).

Letter-references to figs. 1, 2, and 3 :—

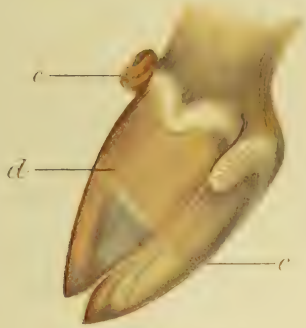
a, claw of pollex.
b, " second digit.
c, " third "
d, " fourth "
e, short broad nail of fifth digit.

4. Right pes, plantar (posterior) aspect (x 2).

5. " " dorsal (anterior) aspect (x 2).

Letter-references to figs. 4 and 5 :—

a, claw of hallux.
b, " second digit.
c, " third "
d, " fourth "
e, short broad nail of fifth digit.



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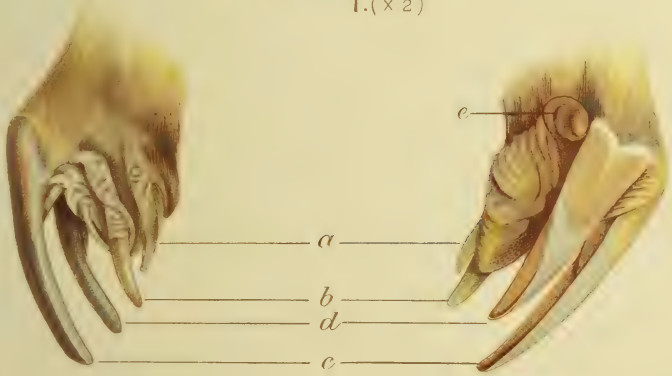

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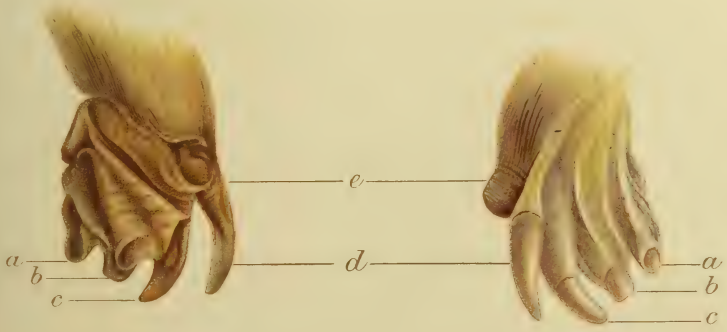


4.(x 2)

5.(x 2)

EXPLANATION OF PLATE V.

FIGURES.

1. *Notoryctes typhlops*. Skeleton (*nat. size*). For convenience the appendages of one side only are represented.

   e, first rib.
   f, keel of presternum.
   l, spinous process of eighth vertebra.
   m.s.s., mesoscapular segment of scapula.
   p, patella.

   The dotted line running along the spine marks the extent of the nuchal muscles.

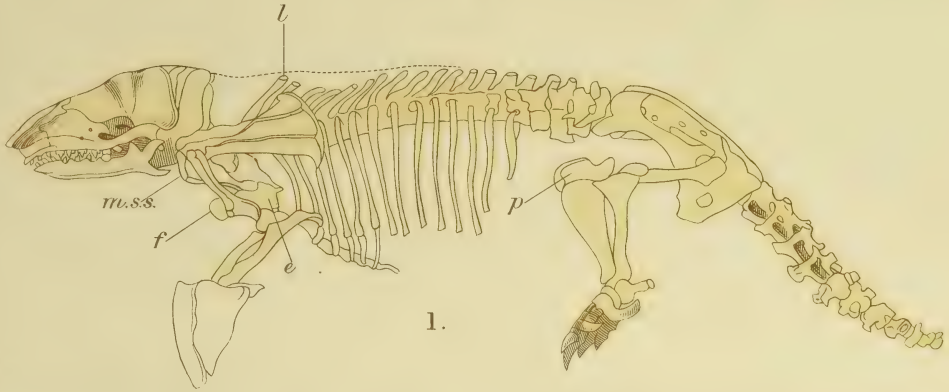
2. Axial skeleton (*nat. size*).

   a, atlas.
   ac, acetabulum.
   c, fused cervical vertebræ (II.—VI.).
   e, first rib.
   f, presternum.
   t, transverse processes of lumbar vertebræ.
   s.p, symphysis pubis.
   y, chevron bones of caudal vertebræ.

3. Ventral view of posterior part of abdomen of first specimen received, showing indication of pouch *m*.

R.C.F. del.

3.



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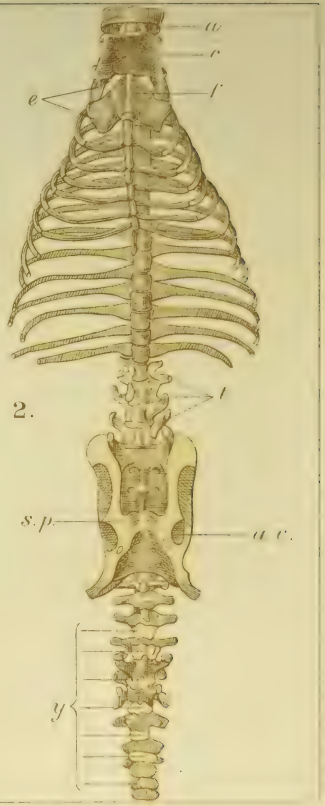

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H.B. lith.

EXPLANATION OF PLATE VI.

FIGURES.

1. *Notoryctes typhlops.* Lateral view of skull.
   a, triple ridge on vertex for attachment of nuchal muscles (x 2).
   al, alisphenoid.
   eo, exoccipital.
   m, mastoid.
   oc, occipital condyle.
   ty, tympanic.

2. Foreshortened view of lower jaw (x 2).
   c, condyle.
   n, angle.

3. First maxillary molar, internal view.

4. " " " external view.

5. " " " view from in front and a little below.

6. " " " plan.
   (x 6).
   alv, alveolar border
   p, level of palate

   The remaining letter-references to plates 3, 4, 5, and 6 are sufficiently explained in the text. Similar letters refer to corresponding parts.

7. Second mandibular molar, internal view.

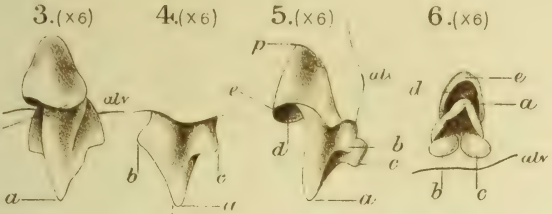
8. " " " external view.

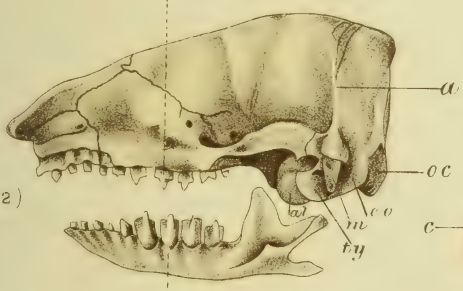
9. " " " plan.

10. " " " view from in front and a little inside.
    (x 6).

    The letter-references are sufficiently explained in the text.

11. Lateral view of the teeth, showing the relation of the maxillary and mandibular series (x 4).
    c, the lower canine. Immediately behind this, the tooth, described in the text as the first mandibular premolar, is missing in the specimen from which the drawing was made.





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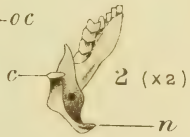

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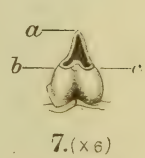

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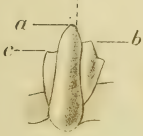

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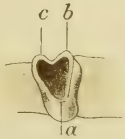

9.(x6)

10.(x6)

11.x4)

EXPLANATION OF PLATE VII.

FIGURES.

1. *Notoryctes typhlops.* The skull, dorsal view *(nat. size)*.
   - *a*, the triple ridge on vertex for the attachment of nuchal muscles.
2. Base of skull (x 2).
   - *al*, alisphenoid.
   - *eo*, exoccipital.
   - *gf*, glenoid fossa.
   - *m*, mastoid portion of periotic
   - *oc*, occipital condyles.
   - *ty*, tympanic.
3. Hyoid bone (x 2).
   - *bh*, basihyoid.
   - *th*, thyrohyoid.
4. The same from an older specimen (x 2).
   - *c*, thyroid cartilage of larynx.

   Other references the same as in fig. 3.
5. Ventral view of cervical vertebræ and presternum (x 2).
   - *a*, atlas.
   - *b*, odontoid process of axis.
   - *c*, fused cervical vertebræ, II.—VI.
   - *d*, body of seventh cervical vertebræ.
   - *e*, first rib.
   - *f*, presternum.
   - *g*, second rib.
   - *h*, sternal segment of second rib.
   - *i*, second segment of mesosternum.
6. Lateral view of a portion of the anterior part of the axial skeleton (x 2).
   - *b*, odontoid process of axis.
   - *c*, fused cervical vertebra—II.—VI.
   - *d*, neural arch of seventh vertebra.
   - *e*, first rib.
   - *f*, keel of presternum.
   - *g*, second vertebral rib.
   - *h*, sternal rib of above.
   - *i*, mesosternum.
   - *k*, xiphisternum.
   - *xxxx*, cartilaginous segments of fourth, fifth, sixth, and seventh sternal ribs.
7. Xiphisternum, ventral view (x 2).
   - *k*, marks the junction of the bony xiphisternum with its cartilaginous expansion.
8. View of anterior orifice of thorax (x 2).
   - *d*, neural arch of seventh vertebra.
   - *e*, first rib.
   - *f*, presternum.
   - *l*, spinous process of eighth vertebra.
   - *m*, transverse process of seventh vertebra.
   - *n*, articular surfaces of first rib for the laterally expanded body of the sixth cervical vertebra.
   - *o*, articulation of first rib with presternum.
9. Second lumbar vertebra, anterior view (x 2).
   - *a*, spinous process.
   - *b*, metapophysis.
   - *c*, transverse process.
   - *d*, hypopophyses.
   - *z*, anterior zygapophysis.

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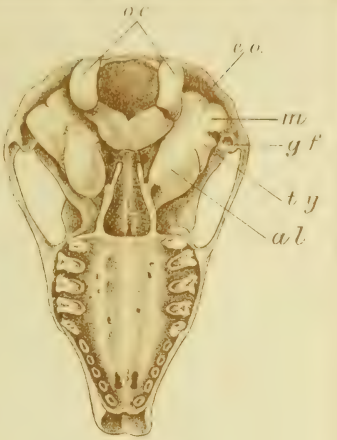

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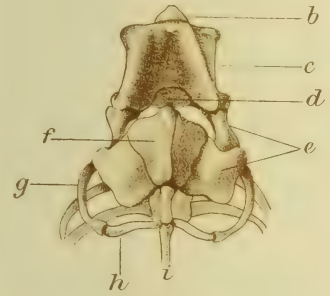

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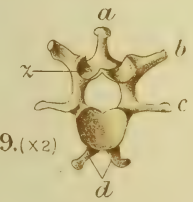

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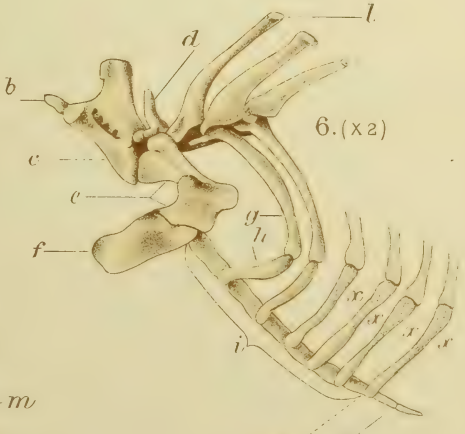

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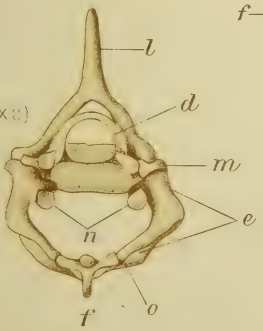


8.(x2)

7.(x2)

x.x.x, mark the superior articulation surfaces for the palmar sesamoid bone.

y.y, (placed towards the bases of the large third and fourth claws) indicate the inferior articular surfaces for the palmar sesamoid bone.

The arrow passes through the foramen of the scapho-carpal.

5a. Palmar sesamoid bone, palmar aspect (x $2\frac{1}{2}$).

x.x.x and *y.y*, indicate the position of its articular surfaces on the side away from the observer, which correspond with the surfaces of the preceding figure similarly marked.

6. Left femur, anterior aspect (x 2).

g.t, great trochanter.

l.t, lesser trochanter.

7. Left tibia, fibula and patella, external aspect (x 2).

a, points to the surface of the patella, with which it articulates with the femur. The edge of the surface only is shown.

f, fibula.

o, foramen through head of fibula. Just beneath this, on the side opposite to that shown in the figure, is the articular surface, which is partly for the superior tibio-fibular articulation, and partly for the femur.

p, patella.

t, tibia.

8. Left pes, dorsal aspect (x $2\frac{1}{2}$).

a, *b*, *c*, *d*, *e*, } claws of digits in their proper order, *a* being that of the hallux

a, astragalus.

ca, calcaneum.

cu, cuboid.

ic, internal cuneiform.

m, fifth metacarpal.

mc, middle cuneiform.

s, sesamoid bone.

sc, scaphoid.

8a. The fifth metacarpal showing its large hamular expansion, external aspect (x $2\frac{1}{2}$).

8b. Internal view of the large flat tibial sesamoid (x $2\frac{1}{2}$).

9. The skin has been removed from the head and neck, showing the large salivary glands (*nat. size*).

a, meatus auditorius externus.

p, parotid.

s, submaxillary.

sm, tendon of sterno-mastoid.

EXPLANATION OF PLATE VIII.

FIGURES.

1. *Notoryctes typhlops.* Left scapula (x 2).
   - *a*, acromion.
   - *cb*, coracoid border.
   - *cl*, clavicle.
   - *g*, glenoid fossa.
   - *gb*, glenoid border.
   - *m.s.s*, mesoscapular segment.
   - *p*, *vide* text.
   - *s*, mesoscapular spine.
   - *ss*, second spine.

1a, 1b. Transverse sections through the scapula at points indicated by the corresponding dotted lines (x 2). For letter-references see fig. 1.

2. Left humerus, postero-external view (x 2). For letter-references see fig. 3.

3. Left humerus, antero-internal aspect (x 2).
   - *dr*, deltoid ridge.
   - *e.ep*, external epicondyle.
   - *gt*, great or external tuberosity.
   - *h*, head.
   - *i.ep*, internal epicondyle.
   - *lt*, small or internal tuberosity.
   - *r*, articular surface for radius.
   - *u*, articular surface for ulna.

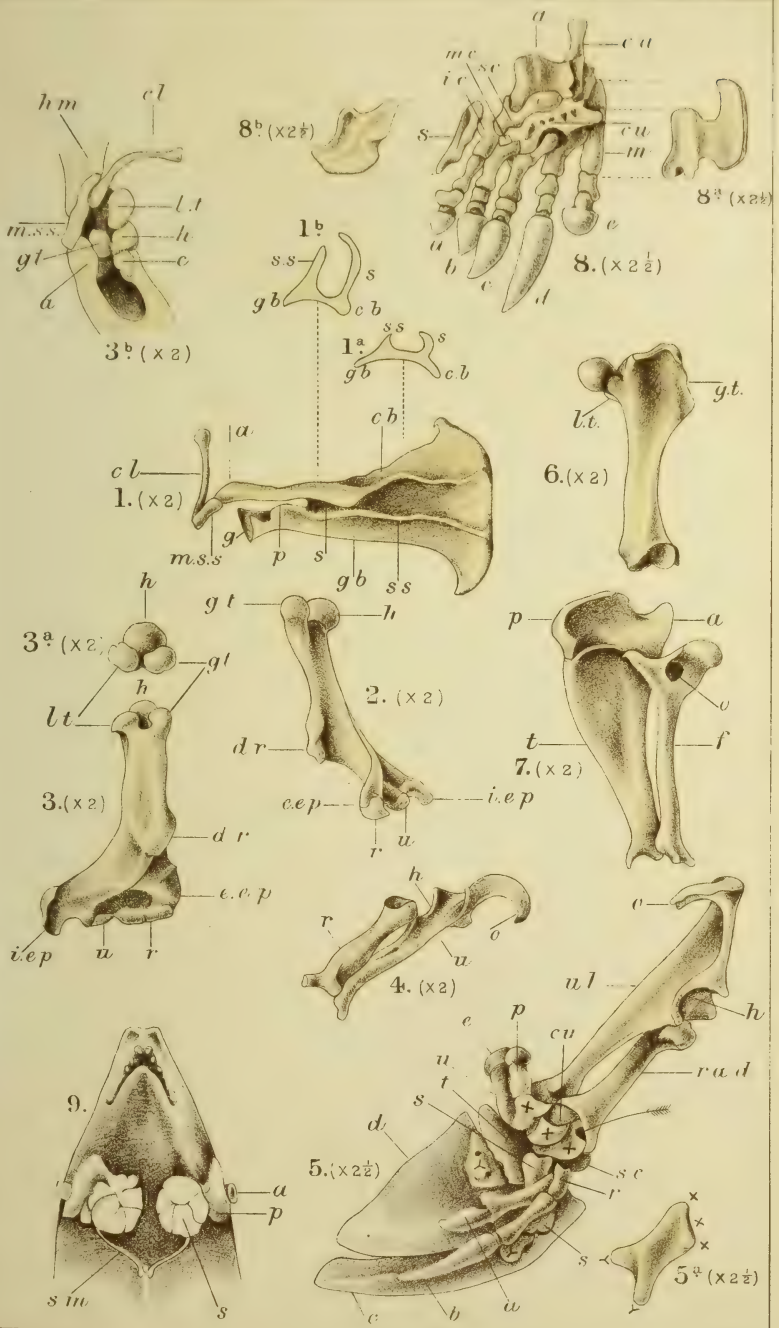
3a. End view of upper extremity of humerus (x 2). For letter-references see fig. 3.

3b. Superior view of parts about the left shoulder-joint *in situ*, with the ligaments left attached (x 2).
   - *a*, acromion.
   - *c*, coracoid process.
   - *cl*, clavicle.
   - *g.t*, external or great tuberosity.
   - *h*, head of humerus.
   - *hm*, shaft of humerus.
   - *l.t*, internal or small tuberosity.
   - *m.s.s*, mesoscapular segment.

4. Left radius and ulna. Postero-external aspect (x 2).
   - *h*, sigmoid notch for humerus.
   - *o*, olecranon.
   - *r*, radius.
   - *u*, ulna.

5. Left manus and forearm, internal or palmar aspect (x 2½).
   - *a*, claw of 1st digit.
   - *b*, " 2nd "
   - *c*, " 3rd "
   - *d*, " 4th "
   - *e*, " short nail of 5th digit.
   - *cu*, cuneiform.
   - *h*, sigmoid notch for the humerus.
   - *p*, pisiform. To this bone belongs the articular surface marked *x* nearest to *p*.
   - *r*, metacarpal common to the first and second digits.
   - *rad*, radius.
   - *sc*, the scapho-carpal of the text.
   - *s* and *s*, metacarpal of third digit.
   - *t*, " fourth "
   - *u*, " fifth "
   - *ul*, ulna.

(For continuation of Explanation of Plate VIII. see back).



R.C.F. del.

H.B. lith.

EXPLANATION OF PLATE IX.

FIGURES.

1. *Notoryctes typhlops.* Sacrum and pelvis, side view (x 2).
   ac, acetabulum.
   il, ilium.
   m, metapophysis of the fourth, or last, lumbar vertebra.
   mm, ankylosed metapophyses.
   o, obturator foramen.
   s, spinous process of third lumbar vertebra.
   ss, spinous processes of first caudal vertebra.
   t, transverse process of first sacral vertebra.
   tr, ankylosed transverse processes of sacral vertebræ.
   tt, transverse process of last lumbar vertebra.

2. Dorsal view of the sacrum and pelvis (x 2).
   az, anterior zygapophyses.
   mm, ankylosed metapophyses.
   s, ankylosed spinous processes. These, meeting the metapophyses on the right side, form a completely closed canal. On the left side the two sets of fused elements do not quite meet, so that the canal is left open.

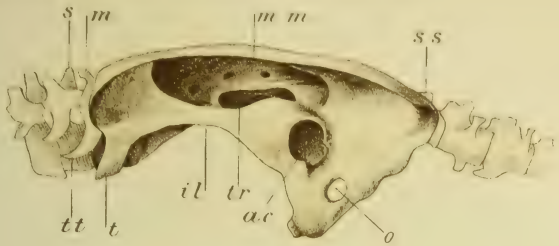
   The foramina are those of the dorsal division of the spinal nerves.

3. Ventral view of the sacrum and pelvis (x 2).
   ac, acetabulum.
   c, transverse process of second lumbar vertebra.
   il, ilium.
   is, ischium.
   pz, posterior zygapophyses.
   sp, symphysis pubis.

4. Outline of posterior outlet of pelvis (x 2).
   mm, metapophysis.
   s, spinous process.
   sp, symphysis pubis.

5. Urinary and generative organs; (half diagrammatic); ventral aspect *(nat. size)*.
   a, anus.
   ad, adrenal.
   ag, anal gland.
   b, bladder.
   ep, epididymis.
   k, kidney.
   p, penis, the point of which emerges within the cloaca from a preputial sheath formed out of the cloacal wall (vid. fig. 6).
   r, rectum.
   t, testis.
   u, ureter.
   ur, urethra.
   vd, vas deferens.

6. The cloaca has been laid open by a dorsal slit, and the figure shows the point of the penis within it, slightly withdrawn from the sheath formed out of the cloacal wall, in which, ordinarily, it lies almost completely retracted.



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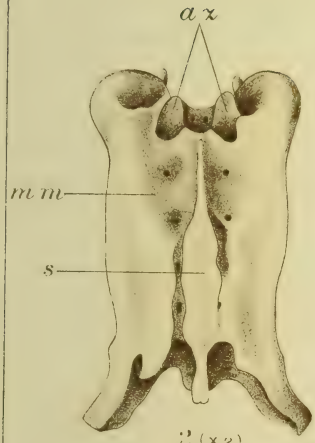

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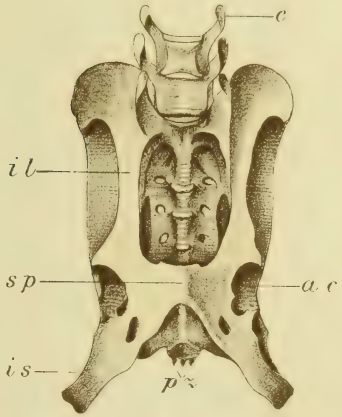

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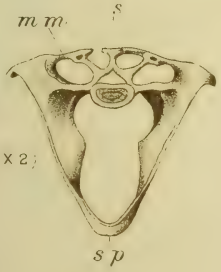

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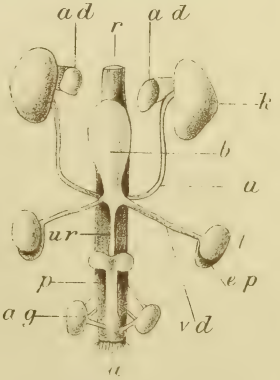

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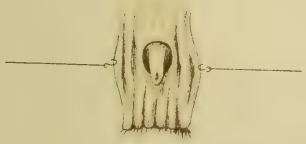


6 (×2)

In conclusion, my best thanks are due to Miss Rosa Fiveash for the very great pains bestowed upon the drawings which illustrate this paper. Accurately and carefully drawn to scale, they will in many instances supply useful information as to size and form, and render more intelligible my own imperfect descriptions. To Mr. H. Barrett, of the South Australian Government Printing Office, my thanks are also due for his careful reproduction of the plates, and to the Executive of South Australia for permitting the work of a scientific society to be done in a public institution.

Descriptions of New Australian Lepidoptera.

By E. Meyrick, B.A., F.Z.S.

[Read June 2, 1891.]

SYNEMONIDÆ.

Synemon.

Syn. leucospila, n. sp.

Male and female, 31-42 mm. Head, thorax, abdomen, and legs dark fuscous, somewhat sprinkled with whitish. Palpi whitish, above dark fuscous. Antennæ dark fuscous, ringed with white. Forewings elongate-triangular, hindmargin rounded, rather oblique; rather light fuscous-grey; base and anterior half of costa suffused with dark fuscous; an irregular suffused dark fuscous fascia before middle, formed of three rounded confluent spots, uppermost and sometimes others also margined posteriorly with an ochreous-white suffusion; a roundish dark fuscous blotch beneath costa beyond middle, posteriorly margined by an ochreous-white suffused band or series of spots; two rows of cloudy dark fuscous spots before hindmargin, and a third marginal: cilia grey, tips whitish or white. Hindwings blackish-fuscous; a roundish pale yellowish discal spot; a yellow-whitish subterminal band, not reaching costa or inner margin, often divided into four or five spots, of which the middle one is often very small or absent; a submarginal series of seven white spots, three upper small, others rather large, lowest suffused; cilia fuscous, tips white.

Geraldton, West Australia; abundant on the plains near the town in November. The species is very distinct by its white or whitish markings.

Syn. heliopis, n. sp.

Male and female, 27-35 mm. Head, thorax, and abdomen fuscous. Palpi snow-white. Antennæ dark fuscous, ringed with white. Legs fuscous, femora white beneath, tibiæ ochreous beneath. Forewings elongate-triangular, hindmargin strongly rounded, rather oblique; fuscous, sometimes rather darker in disc; a narrow oblique transverse white median discal spot; a very obscure suffused band of light grey scales extending beneath middle from base to beneath discal spot and thence along upper half of hindmargin to apex; a slightly curved band of about five subconfluent small ochreous-whitish suffused spots on upper hal

of wing at three-fourths: cilia fuscous. Hindwings blackish-fuscous, ferruginous-tinged; a small suffused orange discal spot; a very broad deep orange hindmarginal band, not reaching costa, suffused at anal angle, including a submarginal series of small subconfluent blackish-fuscous spots, becoming larger on lower half; a blackish-fuscous hindmarginal line: cilia fuscous.

Geraldton, West Australia; in November, five specimens. This and the two following species are nearly together, but certainly distinct; *S. heliopis* may be recognised by the narrower transverse discal spot of the forewings, the fuscous cilia, larger discal spot of hindwings, and very broad orange band, with a series of well-defined dark spots in both sexes.

Syn. austera, n. sp.

Male and female, 40 mm. Head, thorax, and abdomen whitish-fuscous. Palpi snow-white. Antennæ dark fuscous, ringed with white. Legs whitish-ochreous. Forewings elongate-triangular, hindmargin strongly rounded, rather oblique; pale fuscous, ochreous-tinged; veins partially marked with blackish-fuscous lines, an irroration of grey-whitish scales forming a band beneath middle from base to two-thirds, thence curved upwards to costa at four-fifths, and also a narrower band along hindmargin, partially confluent with preceding above middle; a triangular white median discal spot; a faintly marked ochreous-whitish suffusion preceding the subterminal band on upper half of wing, divided into spots by dark veins: cilia whitish-ochreous, with one or two fuscous lines, tips whitish. Hindwings dark fuscous; in female a suffused orange discal dot; an orange fascia extending from middle of wing to apex, somewhat dilated upwards; in female a suffused submarginal series of cloudy orange spots before upper two-thirds of hindmargin; cilia whitish, basal third fuscous.

Carnarvon, West Australia; in October, two fine specimens taken together in a damp place on the plain. Easily distinguished from the preceding and following by its larger size, lighter colouring, the triangular discal spot of the forewings, and the less extended orange colouring of the hindwings.

Syn. brontias, n. sp.

Male and female, 25-33 mm. Head, thorax, and abdomen fuscous. Palpi snow-white. Antennæ dark fuscous, ringed with white. Legs fuscous, sprinkled with white beneath. Forewings elongate-triangular, hindmargin obliquely rounded; fuscous, somewhat suffused with darker in disc, and sprinkled with grey-whitish below middle and towards hindmargin; an ill-defined roundish ochreous-white discal spot; a sinuate band of suffused whitish spots, separated by dark veins, at about two-thirds nearly

reaching costa and inner margin; two faintly defined series of elongate darker fuscous spots before and beyond this; cilia fuscous, mixed with whitish. Hindwings dark fuscous; an orange discal dot; a broad orange hindmarginal band, hardly reaching apex, suffused towards anal angle, including in male an undefined submarginal fuscous suffusion, in female a series of four or five cloudy dark fuscous spots; a dark fuscous hindmarginal line; cilia fuscous, mixed with whitish.

Carnarvon, West Australia; in October, four specimens on the plain. Somewhat smaller than *S. heliopis*, and distinguishable by the roundish discal spot of forewings, the two posterior series of indistinct darker spots, the series of whitish spots nearly reaching both margins, the cilia mixed with whitish, and the dark subterminal spots of hindwings represented in male by an undefined suffusion.

LIMACODIDÆ.

Momopola, n. g.

Antennæ one-half, in male bipectinated throughout, but pectinations on terminal half extremely short. Palpi moderate, porrected, with dense appressed scales. Forewings with veins 7 and 8 out of 9, 10 out of 9 below 7. Hindwings with veins 6 and 7 stalked.

Mom. miltogramma, n. sp.

Male, 34 mm. Head, palpi, thorax, and abdomen light orange, mixed or tinged with red. Antennæ greyish-ochreous, pectinations *a* 4, *b* 6. Legs orange mixed with red hairs, tarsi black ringed with white. Forewings triangular, hindmargin rounded, rather oblique; pale whitish-grey; costal edge reddish-orange; all veins marked with broad crimson-red streaks, paler posteriorly; some dark grey irroration towards base in middle; a small median discal spot of blackish irroration; two transverse sinuate streaks of blackish irroration, not reaching costa, first beyond middle, touching discal spot, second subterminal: cilia pale yellow. Hindwings pale rosy; cilia pale yellow.

Queensland; one specimen received from Mr. Diggles.

BOMBYCIDÆ.

Bombyx, *Schrk.*

Bomb. mioleuca, n. sp.

Male, 35 mm.; female, 50 mm. Head, palpi, thorax, abdomen, and legs mixed with dark fuscous and whitish hairs, appearing grey. Antennæ dark fuscous, pectinations ochreous-orange in male 10, in female 3. Forewings elongate-triangular, hind-

margin obliquely rounded; fuscous, mixed with whitish and dark fuscous hairscales; costal edge in male dark fuscous; two strong dark fuscous lines, first from quarter of costa to two-fifths of inner margin, rather irregularly sinuate, second from before two-thirds of costa to beyond middle of inner margin, with a slight angular dentation outwards above middle, and somewhat bent inwards below middle; a small transverse-oval fuscous-whitish discal spot before middle, circled with blackish; an indistinct irregular subterminal series of darker spots: cilia whitish, barred with dark fuscous. Hindwings dull whitish; cilia whitish, barred with dark fuscous.

Mount Lofty, South Australia; a pair received from Mr. E. Guest, who has taken others.

LIPARIDIDÆ.

Darala, *Walk.*

Dar. xantharcha, n. sp.

Male, 63 mm. Head fuscous. Antennæ blackish, stalk sprinkled with pale yellowish. Thorax blackish, somewhat mixed with whitish and ferruginous hairs. Abdomen ferruginous-red, anal-tuft yellow-whitish. Legs blackish, sprinkled with pale yellowish, hairs of femora partly ferruginous-red. Forewings triangular, hindmargin rounded, somewhat oblique; dark fuscous, densely strewn with white hairs, and a few bright ferruginous scales; three waved blackish-fuscous lines, first from one-fourth of costa to one-third of inner margin, sharply angulated above middle, second and third close together beyond middle, slightly curved inwards; a small, round, white black-circled discal spot above middle, immediately preceding second line; a moderate hindmarginal band nearly without white irroration, its anterior edge straight, dentate. Hindwings pale whitish-yellow, deeper towards base, with some orange hairs in submedian fold; a faint grey straight median line; a broad dark-grey hindmarginal band, irrorated with whitish-yellowish, anterior edge faint and preceded by a series of faint grey spots, and including a faint pale dentate subterminal line. Undersurface of all wings whitish, with a black discal dot and median line; disc of forewings orange, with white black-circled spot as above.

Koolunga, South Australia; one specimen in the collection of Mr. E. Guest. It is a handsome and extremely distinct species.

Dar. protocentra, n. sp.

Male, 48 mm. Head, palpi, thorax, abdomen, and legs dull brown-reddish. Antennæ whitish, pectinations reddish-fuscous (10). Forewings triangular, hindmargin rounded, little oblique;

rather light brown-reddish, with a slight ochreous suffusion ; a white discal dot at one-third, and a second in middle ; an indistinct, slender, waved, slightly curved, darker, reddish postmedian line ; a slightly curved subterminal series of black dots. Hindwings with groundcolour and subterminal dots as in forewings ; an indistinct, slightly sinuate reddish line at one-third, and another in middle.

Fernshaw, in Victoria ; one specimen in November.

Dar. asterias, n. sp.

Male, 38 mm. Head, palpi, antennæ, thorax, abdomen, and legs rather light brown-reddish ; antennal pectinations dark fuscous (12). Forewings triangular, hindmargin rounded, slightly oblique ; rather light brown-reddish ; a white dot, obscurely circled with dark fuscous, in disc at two-fifths, and a second at three-fifths. Hindwings rather light brown-reddish.

Melbourne, Victoria ; one specimen in November.

Ocneria, *HS.*

Ocn. heliaspis, n. sp.

58-60 mm. Male. Head and thorax bright ferruginous. Palpi pale orange. Antennæ fuscous, pectinations pale rosy-fuscous (7). Abdomen light reddish-orange. Legs whitish, anterior and middle tibiæ mixed with blackish. Forewings triangular, hindmargin oblique, hardly waved, with a marked sinuation inwards in middle ; ferruginous ; five obscure cloudy darker slightly curved lines, marked with fine dark grey irroration, first two before middle, third postmedian, fourth and fifth waved, subterminal ; a blackish median discal dot ; hindmargin partially suffused with darker. Hindwings with hindmargin rounded, inner margin long, so that anal angle appears produced ; bright deep orange ; faint traces of two fine waved darker lines beyond middle ; lower third of hindmargin rather broadly suffused with fuscous.

Female. Head, palpi, thorax, and abdomen ochreous-whitish. Antennæ dark fuscous, pectinations 2. Legs fuscous. Forewings triangular, hindmargin oblique, almost straight ; ochreous-grey-whitish ; a blackish-grey median discal dot ; two fine waved dark grey lines, representing third and fourth of male, first faint. Hindwings formed as in male, but anal angle less produced ; ochreous-whitish, faintly rosy-tinged ; a cloudy grey discal dot ; two grey lines as in forewings, but very faint.

Newcastle, New South Wales; three specimens.

Laelia, *Stph.*

Lael. eremaea, n. sp.

Male and female, 30-34 mm. Head and palpi pale ochreous-orange. Antennæ white, pectinations ochreous-fuscous, in male 14, in female 1. Thorax ochreous-white, anteriorly suffused with pale ochreous-orange. Abdomen ochreous-whitish, in female orange beneath and tinged with orange posteriorly above. Legs ochreous-orange. Forewings somewhat elongate-triangular, in male more elongate, hindmargin somewhat obliquely rounded; rather thinly scaled, whitish-ochreous, paler in female, costa more ochreous, especially in male. Hindwings in male whitish-ochreous, in female more whitish.

Duaringa, Queensland; five specimens received from Mr. G. Barnard. This species, apparently common, stands in some collections as *obsoleta*, F., but I think erroneously; Fabricius' species seems to be rightly identified as a *Porthesia* (the common white Acacia-feeding species).

Porthesia, *Stph.*

Porth. anacausta, n. sp.

Male, 33-34 mm. Head white. Palpi orange. Antennæ whitish, pectinations blackish (*a* 12, *b* 14). Thorax, abdomen, and legs white; breast and anterior femora and tibiæ orange, anterior tarsi fuscous above. Forewings rather elongate-triangular, hindmargin obliquely rounded; white, very faintly rosy or ochreous-tinged; a small dark grey suberect mark at anal angle. Hindwings white.

Tasmania; four specimens received from Mr. G. Barnard.

Porth. hololeuca, n. sp.

Male, 31-33 mm. Head white, lower part of face tinged with orange. Palpi orange. Antennæ white, pectinations light ochreous (*a* 10, *b* 12). Thorax, abdomen, and legs white; breast and anterior femora and tibiæ orange, anterior tibiæ fuscous above. Forewings elongate-triangular, without markings. Hindwings white.

Female, 34 mm. Head, palpi, antennæ, thorax, and legs white; antennal pectinations *a* 5, *b* 7; anal tuft orange, Forewings more elongate than in male, hindmargin more oblique; ochreous-white; a blackish dot in disc at three-fourths, and a smaller one rather near and directly beneath it. Hindwings white.

Mount Lofty, South Australia; Geraldton, West Australia; in November, five specimens.

Porth. iobrota, n. sp.

Male, 23-25 mm. Head, palpi, antennæ, thorax, abdomen, and legs deep orange; antennal pectinations *a* 8, *b* 10. Forewings triangular, hindmargin rather obliquely rounded; ferruginous-orange, tinged with brownish, except towards anterior half of costa; in one specimen with ill-defined first and second lines of whitish-ochreous scales—first from one-third of costa to two-fifths of inner margin, somewhat angulated above middle, second from two-thirds of costa to two-thirds of inner margin, obtusely angulated in middle. Hindwings brownish-orange.

Queensland; three specimens (coll., Lucas).

Porth. pyraustis, n. sp.

Male, 19 mm. Head, palpi, antennæ, thorax, abdomen, and legs orange; antennal pectinations 8. Forewings triangular, hindmargin obliquely rounded; rather dark ferruginous-fuscous, basal half strewn with ferruginous-orange hairs except along costa; costal edge orange: cilia wholly orange. Hindwings dark grey; cilia grey, becoming pale ochreous towards tips.

Queensland; one specimen received from Mr. G. H. Raynor.

NOCTUIDÆ.

Agarista, *Leach.*

Agar. platyxantha, n. sp.

Male, 47-53 mm. Head and thorax as in *A. Donovani;* abdomen orange, two basal segments black, rest with narrow black basal rings. Forewings as in *A. Donovani*, except as follows:—All spots larger and yellower; a yellow suffusion near base below middle; a large yellow additional spot between veins 1 and 2 before anal angle. Hindwings as in *A. Donovani*, but fascia broader and yellower, preceded by a quadrate yellow discal spot almost confluent with it below middle.

Female, 40-48 mm. Forewings as in *A. Donovani*, but hindmargin less oblique; markings yellow, first discal spot almost obsolete, second more oval, a small distinct additional spot between veins 1 and 2 before anal angle, cilia not dotted on upper half. Hindwings as in *A. Donovani*, but fascia between veins 4 and 6 projecting further posteriorly.

Cooktown and Cairns, Queensland; six specimens (coll., Macleay); there is also one unnamed in the British Museum. I think the sexes are rightly placed together; the differences between them them are quite analogous to those found in *A. Kochii.*

AGAR. TETRAPLEURA, n. sp.

Female, 48 mm. Head, palpi, and thorax black, sprinkled with whitish-yellowish dots. Abdomen black, segmental margins whitish-yellowish, apex orange. Legs black, apex of joints white, hairs of coxæ orange. Forewings somewhat elongate-triangular, hindmargin rounded, somewhat oblique; purplish-black; a few scattered white scales towards base, forming a ring beneath costa; a rather narrow, straight, irregular-edged fascia of six partially confluent whitish-yellow spots from costa beyond middle to hindmargin above anal angle, but not quite reaching margins; a short line of a few white scales from costa at two-thirds: cilia purple-blackish, round apex snow-white. Hindwings purple-black; a nearly straight, rather narrow, entire whitish-yellow fascia from beneath costa at two-thirds to inner margin above anal angle, outer edge waved, and sinuate below middle; a small triangular whitish-yellow apical spot; cilia purple-blackish, round apex whitish-yellow.

New South Wales; I have one fine specimen of this very distinct species, of which I unfortunately omitted to record the locality when captured, now 13 years ago; but I believe it was on the hills above the Bulli Pass.

CALLIPYRIS, n. g.

Face rounded; ocelli present; tongue developed. Antennæ in male filiform, rather strongly ciliated (2). Palpi moderate, porrected, second joint with appressed scales beneath, projecting triangularly above towards apex, terminal joint short, obtuse. Thorax and abdomen without crests. Tibiæ rather densely scaled, not spinose. Forewings with veins 7 and 8 out of 9, 10 anastomosing with 9. Hindwings with vein 5 well developed, parallel to 4, 6 and 7 from a point. Probably allied to *Sophta* and *Sventia*.

CALL. DROSERA, n. sp.

Male and Female, 15-19 mm. Head antennæ, thorax, and abdomen deep reddish-ochreous, thorax and abdomen with brilliant silvery-metallic gloss. Palpi and legs orange, anterior legs reddish-ochreous. Forewings rather elongate-triangular, apex tolerably pointed, hindmargin forming a strong obtuse projection below middle on vein 3, concave above this and slightly sinuate below it; fuscous, more or less tinged with reddish-ochreous anteriorly and towards costa, irregularly strewn with brilliant silvery-metallic scales; a fine whitish line at one-third, white towards costa, angulated outwards above and below middle, inwards in middle; an oblique snow-white streak from costa beyond middle, emitting an obscure whitish line to three-fourths of inner margin,

angulated similarly to hindmargin ; costal streak followed by a triangular orange costal blotch, containing two white dots on costa; hindmarginal area deep ferruginous mixed with orange, becoming orange at apex and anal angle, containing a submarginal streak of mixed bright violet and brilliant silvery-metallic scales : cilia ochreous-orange, terminal half paler. Hindwings with hindmargin waved, slightly bent below middle ; orange-yellow, paler towards costa ; a short erect streak of mixed dark grey and silvery-metallic scales from inner margin in middle, a similar streak of violet and silvery-metallic scales from inner margin above anal angle, and a third at anal angle ; a suffused orange-fuscous hindmarginal fascia ; cilia ochreous-orange, terminal half paler.

Brisbane, Queensland ; Sydney, New South Wales; in September and March, three specimens, appearing to frequent swampy places.

THALPOCHARES, *Ld.*

THALP. BASILISSA, n. sp.

Male, 20 mm. Head pale yellow, front of collar white. Palpi rosy-whitish, terminal joint fuscous. Thorax deep yellow, with a whitish-rosy central dorsal stripe. Abdomen whitish-ochreous, yellow on back near base. Forewings triangular, apex rectangular, hindmargin bowed, little oblique ; bright deep yellow ; costal edge rosy on basal third; a fine straight white line from two-fifths of inner margin to three-fifths of costa, thence continued along costa to near apex ; terminal half beyond this line bright crimson-rosy, slightly tinged with yellow-ochreous except anteriorly ; a moderately broad straight yellow-ochreous fascia from inner margin before anal angle to near costa before apex, but not reaching it, marginal towards costa with two or three white dots on veins, and posteriorly with two or three black dots : cilia bright rosy, terminal half snow-white. Hindwings whitish, towards inner margin yellowish ; a suffused grey hindmarginal fascia, becoming rosy at anal angle ; cilia dark grey mixed with yellowish, and at anal angle with rosy, terminal half snow-white.

Queensland ; one specimen received from Mr. Diggles ; very distinct.

THALP. PYRASPIS, n. sp.

Male and Female, 14-17 mm. Head, palpi, antennæ, and thorax dark fuscous ; palpi beneath and at apex of second joint whitish-ochreous. Abdomen dark fuscous, partially suffused with orange. Legs dark fuscous, apex of joints whitish-ochreous. Forewings somewhat elongate-triangular, hindmargin obliquely rounded ; dark slaty-fuscous, sometimes mixed with reddish anterior half marked with several irregular black transverse lines,

bounded by a nearly straight black line from middle of costa to two-thirds of inner margin, forming a short triangular projection in middle; terminal half more or less mixed or suffused with whitish, usually forming a broad fascia, anteriorly sharply defined, posteriorly suffused beyond this line, and a more or less entire hindmarginal fascia, sometimes strongly mixed with orange: cilia dark fuscous, with a white patch at apex, and another above anal angle. Hindwings bright deep orange; a moderate dark fuscous hindmarginal fascia; cilia dark fuscous, terminal half grey-whitish, slightly rosy-tinged.

Duaringa, Queensland; received commonly from Mr. G. Barnard. This and the next species are allied together, but very distinct from anything else.

THALP. CHRYSASPIS, n. sp.

Female, 20 mm. Head, palpi, antennæ, and thorax dark fuscous. Abdomen dark fuscous, sides mixed with yellowish. Legs dark fuscous, irrorated and ringed with ochreous-whitish. Forewings elongate-triangular, hindmargin rather obliquely rounded, waved; fuscous, on posterior half purple-reddish fuscous; an irregular obscure darker edged line at one-third; a rather narrow dark fuscous median fascia, attenuated on costa, anterior edge straight, posterior edge rather projecting in middle; reniform spot obscurely indicated above this projection, sides partially blackish-margined; a paler dark-margined line at two-thirds, angulated above middle, margining median fascia on lower half; a waved paler subterminal line, sprinkled with white scales; cilia light fuscous, mixed with ochreous-whitish. Hindwings bright orange; a moderate dark fuscous hindmargined fascia: cilia fuscous, mixed with ochreous-whitish.

Duaringa, Queensland; one specimen received from Mr. G. Barnard.

RIVULA, *Gn.*

RIV. NIPHODESMA, n. sp.

Male, 19 mm. Head, palpi, and thorax light ochreous, mixed with white. Antennæ whitish-ochreous. Abdomen and legs pale ochreous. Forewings rather elongate-triangular, hindmargin rounded, rather oblique; rather deep ochreous-brown; a snow-white subcostal streak from base to apex, broadest in middle, so that lower edge appears curved; a black dot in this streak beyond middle; two short oblique white dashes from costa near apex; a slender white submarginal streak from anal angle to near apex, but not reaching it; a blackish mark at apex beneath subcostal streak, and a hindmarginal row of black dots: cilia grey-whitish, with numerous irregular rows of grey speckles. Hindwings

ochreous-whitish ; a fuscous suffusion along hindmargin ; cilia ochreous-whitish.

Cairns, Queensland ; one specimen received from Mr. G. Barnard.

ELAPHRISTIS, n. g.

Face with slightly-projecting scales ; ocelli present ; tongue developed. Antennæ in male bipectinated, apex filiform. Palpi moderately long, porrected ; second joint with dense, rather projecting scales ; terminal joint short, obtuse. Thorax with small posterior crest. Abdomen with small basal crest. Legs smooth. Forewings with veins 9 and 10 out of 8. Hindwings with veins 3 and 4 from a point, 5 well developed, somewhat approximated to 4 at base, 6 and 7 from a point.

Nearly allied to *Acrarmostis*, but without the peculiar neuration of that genus.

ELAPHR. ANTHRACIA, n. sp.

Male, 16 mm. Head, palpi, and thorax blackish. Antennæ and abdomen grey. Legs blackish, posterior pair grey. Forewings elongate-triangular, hindmargin bowed, rather oblique ; dark slaty-fuscous, slightly sprinkled with whitish ; a small crescentic blackish discal spot ; a fine black irregular line from beyond middle of costa to two-thirds of inner margin, edged posteriorly with ochreous-whitish except near costa, from near costa to middle bent outwards so as to form a rectangular space round discal spot ; a marginal row of large black dots ; cilia dark slaty-fuscous. Hindwings and cilia light fuscous.

Brisbane, Queensland ; two specimens in October.

UROSTOLIDÆ.

I find it necessary to form this new family (referable to the group of the *Geometrina*, and allied to the *Boarmiadæ*) for the following singular genus. In general characters it is related to *Drepanodes* and allied genera, but differs widely from all *Geometrina* in the structure of vein 8 of the hindwings, a character of the highest importance ; this vein is here formed much as in the *Drepanidæ*, and there may possibly be some genetic affinity with that family, though not immediate. In the obsolescence of vein 5 of the hindwings the genus agrees with the *Boarmiadæ*, and differs from all other *Geometrina*.

UROSTOLA, n. g.

Face smooth ; ocelli present, concealed ; tongue developed. Antennæ two-thirds, in male filiform, shortly ciliated. Maxillary palpi obsolete. Labial palpi moderately long, porrected, with dense rough projecting scales, terminal joint short, nearly con-

cealed. Thorax nearly glabrous beneath. Posterior femora in male with apical tuft of long hairs above, tibiæ somewhat dilated, containing tuft of hairs in groove. Forewings with vein 1*b* furcate at base, lower fork faint, 5 from middle of transverse vein, 6 from upper angle of cell, 7 and 8 out of 9, 9 from considerably before angle of cell; 10 out of 9, anastomosing with 11 and then with 9, 11 anastomosing with 12 before anastomosing with 10. Hindwings with frenulum developed; 1*c* absent, 5 absent, 6 and 7 widely remote, 8 anastomosing shortly with upper margin of cell near base, and closely appressed to 7 for a short distance beyond cell.

Probably a very early form of *Geometrina*, related to the ancestral form of the *Boarmiadæ*.

UROST. MAGICA, n. sp.

Male, 24-25 mm. Head and thorax fuscous, face dark reddish-fuscous, fillet whitish-ochreous. Palpi ferruginous. Antennæ pale ochreous, ringed with dark fuscous; ciliations one-third. Abdomen fuscous, sides paler. Legs dark fuscous, orange beneath, coxæ and posterior femora orange. Forewings triangular, slightly elongate, costa arched towards apex, apex nearly rectangular, hindmargin obliquely rounded, rather deeply sinuate inwards on upper half; light fuscous, tinged with ochreous and ashy-purplish, strewn with small obscure dark fuscous transverse strigulæ; costal edge orange, dotted with dark fuscous; an obscure irregular ferruginous-brown line from one-third of costa to before one-third of inner margin; a straight dark fuscous streak from two-thirds of costæ to beyond middle of inner margin, sharply marked anteriorly, suffused posteriorly; a faintly indicated irregular subterminal line, marked with a small round dark fuscous spot below middle; cilia pale ochreous-fuscous. Hindwings with hindmargin rounded, slightly bent in middle; color, strigulæ, and cilia as in forewings; a straight dark fuscous streak from middle of costa to middle of inner margin; a slightly curved series of dark fuscous dots at two-thirds; a small round dark fuscous spot towards hindmargin above middle, and another below middle. Undersurface of both wings deep orange, with numerous dark fuscous strigulæ; a median dark fuscous streak, and subterminal series of cloudy spots.

Brisbane, Queensland; Richmond River, New South Wales; two specimens.

On a Subterranean Water-Supply for the Broken Hill Mines.

By Samuel Dixon.

[Read August 4, 1891.]

Plate X.

In laying before this Society evidences of an unlimited supply of water for the treatment of ores in the Broken Hill line of mines, I trust it may not be considered out of place to explain why such a subject should be discussed in Adelaide rather than in the colony which furnishes it. In the first place, anything which would double the population at Broken Hill must be of great importance to the colony which produces the chief food-supply for that population; secondly, because a much larger proportion of the owners of these mines are resident in this colony; and, thirdly, it must be confessed, because of the neglect which the western division of New South Wales has always received at the hands of the Sydney Government. An instance of this unintelligible neglect has been greatly impressed on me in the extreme difficulty experienced in obtaining the necessary data for this paper; and a still greater instance is to be found in the fact that the richest silver-mines in the world remain without any geological surveyor to chart down the stratigraphical discoveries of the region, which would ultimately save the community thousands of pounds in exploratory shafts and drives.

During this past summer the very greatest difficulty was experienced in obtaining water for the smelters alone, and then not an adequate supply; and the limitation of the weekly output which resulted caused a corresponding drop in capital values, amounting to £3,000,000 alone on the Proprietary stock; and, although temporary supplies have been obtained, concentration is not yet resumed, and some mines have not even attempted a concentrating plant—as, for instance, Block 10, where, as appears from last report, the proportion of ore dumped for future treatment is as 8 to 12 of the ore now smelted.

The scheme known as the Stephens Creek Water-supply is solely dependent on the rainfall, and, in view of its very uncertain and limited quantity, it appears to me that, even should it successfully impound that rainfall, the consumption of fresh water for a population at present of 25,000, and still increasing, will,

with the requirements of the very numerous boilers and smelters, utilise all the water likely to be conserved.

Should this be the case, how is the tremendous amount of water required to concentrate the huge deposits of low grade ore to be provided? On this question depends the very existence of some of the mines, and the doubling of dividends by others; so that I ask for this paper the fullest consideration which the very great importance of the subject demands, and as it appears evident that, contrary to usual experience, the lode itself has utterly failed to supply the quantity needed, it becomes necessary to seek it elsewhere.

We know that the Cretaceous area, which supplies the magnificent artesian wells in this colony, Queensland, and New South Wales, lies far too far away from Broken Hill to be available; and with regard to the scheme for bringing water from the River Darling, not only is the distance very great, but the very intermittent supply contained therein has always seemed to me entirely prohibitory, an opinion intensified by the paper read by Mr. Russell before the Royal Society of New South Wales, November, 1886, and also by the testimony of my friend, Chas. Barritt, Esq., Mallara, River Darling, who writes me—"The river here stopped running in 1866 and 1884, but has several times been nearly stopping, but I cannot specify dates. I do not think the idea of water from the Darling is feasible, except at an enormous expense for conservation. The evaporation on large bodies of water is, roughly, six feet a year, and the Darling not to be relied upon. Twice during the last ten years have I pumped as much as was flowing in the river—once with horse-pump, with two and a-half-inch pipe, and once with steam-pump, four-inch suction. Once I had to dam the river and cut a trench to a waterhole for a supply."

Now, as to an unlimited supply. Flanking the Archæan rocks, which extend to the eastward of Broken Hill and the Barrier Ranges generally, lies a very large area of the Newer Tertiary deposits of intercalated clays and sands; this area is bounded on the north, as far as the Weniteriga Run, by the eastern extension of the Archæan rocks, and along their edge, and in a northern extension of the basin, Messrs. Riddoch have sunk several wells (see chart). Across the river, opposite Wilcannia, some sixty miles to the east, Mount Manara forms the eastern outcrop of the Archæan rocks, which gradually sink down until covered by the recent clays. The southern boundary is to be looked for at the overlapping of the Newer on the Older Tertiaries as represented by the Murray Cliffs. Professor Tate was the first to point out, in his paper on the "Basin of the Lower Murray River," read before this Society in 1884, and published in Vol.

VII. of its Proceedings, that at Overland Corner the Newer Tertiary is a fluviatile deposit resting unconformably against the escarpment of the older formation.

In support of this is the fact that at the cliffs, on the eastern bank of the River Darling, a few miles below the Anabranch Cutting, there is exposed at low water coarse red sandstones, which, accepting Sir A. C. Ramsay's opinion, as quoted by the Professor, must have been deposited in inland isolated waters; and I think close examination of the sandstone at Tanberry Point, still further up the river, will prove it to be the same formation.

The irregularly-stratified sands and clays between these two extremes—Tanberry Point and Overland Corner, some 150 miles south-westerly—afford further fluviatile evidence, as also do the brightly-coloured clay-cliffs exposed at Lake Victoria Head-station.

For our purposes, however, we will take a line westerly from Tanberry Point towards the boundary of this province. South of this line many of the deeper wells are salt. Though shallow, fresh-water basins exist, as, for instance, at Coombo Lake, the most westerly lake filled from the Anabranch overflows, a very ample supply of water was struck at 20 feet; the water contains a good deal of magnesia, and the clays forming the bed of the lake contain a large proportion of crystallised gypsum.

I should here like to hazard the opinion that at one time—a far distant period, no doubt—the Lachlan River emptied itself into the Newer Tertiary basin under present consideration, and that the present Willandra Creek is its representative.

This Newer Tertiary basin, thus roughly defined, measures at its widest 140 miles across. Within its area, water is always to be obtained in a bed of very fine white sand, always at about the same relative depth, and, allowing for local peculiarities, of the same quality, namely, slightly saline; beneath this stratum are other water-bearing ones, as is proved by the bores in Silistria and Aldborough Wells. As to the source of these waters there can be no doubt; and to make it perfectly clear it is necessary to give a short description of the topographical features which render the Darling River so interesting a study to geologists, though the region is indeed quite as interesting to botanic students from the same cause, viz., the extraordinary alternations of flood and drought.

The watershed of the Darling extends from lat. $33\frac{1}{2}^{\circ}$ to $25\frac{1}{2}^{\circ}$ south, and embraces the whole western flow of water between these parallels from the high table-lands, which skirt Eastern Australia at a distance roughly estimated as averaging 200 miles from the Pacific coast. The large rivers formed in

these mountainous table-lands run down rapidly until they reach the chief Tertiary plain of Central Australia, and there spread out in times of flood over hundreds of square miles, until reforming and gradually converging, they form, some distance above Bourke, that muddy, ugly stream, the Darling River, which flows thenceforth in a generally south-westerly direction for the remainder of its course through steep clay banks, some 40 feet high and 70 to 90 yards apart, until it junctions with the Murray; while along its course, for great distances, it is impossible to find a stone as big as a walnut. During heavy floods, which occur at very irregular intervals, it overflows its banks, and the water, with much fine mud in suspension, spreads over extensive plains, filling numerous creeks, lakes and billabongs, the only points not inundated being the peculiar red loamy sand-dunes. Between 60 and 70 miles above Wilcannia several creeks leave the river, and, flowing southerly, fill an extensive system of lakes which flank Mount Manara and the scrubby rises immediately to the south; ultimately the outflows gather into the Tallawalka, which turns abruptly west and enters the river below Menindie. Some idea of the extent of country thus inundated may be formed from the fact that the water continues to fill the most southern of these lakes three months after it has ceased to flow out of the river.

Immediately south of Menindie, a western system of overflow commences and fills Menindie, Cawndilla and Tandou lakes; and immediately below Netley Head-station the Anabranch also leaves the river on the western bank, and, after filling up an extensive lake system of its own, finally reaches the Murray 15 miles below Wentworth, where its opaque muddy stream mingles with the dark clear waters of the Murray.

As the floods subside these immense flooded areas dry-up and crack in every direction with numerous deep interstices, which, when another flood advances, serve as conduit pipes for the water to flow-down into the underlying sand stratum. Some conception may be formed of the extent to which this occurs when we find that it has been observed that for a whole week the flood has poured-down into one such crack without being able to advance further.

That these subterranean waters must total-up to something stupendous is clearly apparent when we recollect the hundreds of square miles over which storage goes on, flood after flood; and that several such basins must exist at different levels within the whole Darling basin, the varied quality of the springs oozing from the river-banks, at low water, puts beyond dispute. That some very big basins also exist between Bourke and the western slopes of the watershed appears very convincingly from Mr. Russell's paper, which I now quote:—

"For the past ten years, upon the assumption just referred to the discharge of the Darling River (at Bourke) has been taken as a percentage of the rainfall, and the yearly amount has varied from 5·81 to 0·09 per cent., the mean for the ten years being 1·46 per cent., a startling result, and one which I believe to be without parallel in any country in the world. . . . In Europe 20 to 50 per cent. of the rain flows away in the rivers, in England about 30 per cent., and here in a river—the Murray, with similar basin and rainfall to the Darling—25 per cent. of the rain flows down the river. . . . When we go into figures to see how much it is, we get a surprising result, viz., that it is not less than ten times, and probably 16 times what the river now carries away."—*Journal of Royal Society*, N.S.W., 1889, part 1, Vol. XXIII.

I propose to deal in this paper with the western portion of the basin, as delineated roughly on the chart, which for purposes of reference, I subdivide into the Menindie basin, the Topar basin and the Cuthawarra basin. My deductions of an unlimited supply of water are based on an examination of the wells sunk within these areas. Beginning with the Menindie basin, as nearest to Broken Hill, of its southern extension it is difficult to say more than already described, but the wells Middle Camp, Eaglehawk, North Ita on the Netley Run, and Wanga on the Burta Run, are all of the same general character, 200 feet and over before reaching the drift-sand which contains the water; of these the Wanga Well is the most western within the basin. The other wells hitherto sunk on Burta have been in the southern projection of the older rocks, where they gradually sink under the more recent formation, towards the Older Tertiaries as represented by the Murray cliffs. Speaking of the Menindie basin generally we may expect to find the centre of the depression, or rather its greatest depth, somewhere about the great lakes, not only because they occupy the lowest part of the present plain, but also because of their distance from the ancient rocks. On the other hand, the two semi-detached areas, whether viewed as separate from or as extensions of the main area, are probably the shallowest; for our purposes this does not much matter, as the Menindie basin measures 140 miles across, and from the absence of any outliers of the Archæan rocks whatever (certainly no traces have yet been found), we are justified in treating it as a whole, within whose boundary unlimited supplies of subterranean water exist.

The accompanying map, which sketches in approximately the boundary of the Archæan rocks and the Tertiary basin, is compiled from the official geological map of New South Wales, published by the Department of Mines in 1877, and from

personal information. A reference shows that the basin is widest easterly from Broken Hill, and that its nearest point to that place is on the Redan Run, and here the boundary of the two formations is evident to the most casual observer in the low ridge bisecting the run north-easterly and south-westerly, whilst northerly, towards the Quondong Well, is the most easterly of the Archæan rocks of the Barrier; hence all the wells to the west are comparatively useless, whilst all the eastern ones reach water in the characteristic fine sands. The Quondong Well just referred to, is formed by a bar of the ancient rocks intercepting the soakage of the superficial sands of Stephens Creek, hence its shallow depth (30 feet) and small supply.

The Redan Well, at the Head Station, is 270 feet to water in the drift-sand, here 50 feet thick. A bore was put down another 100 feet, and stopped in blue clay. The water did not rise above the level at which it was first struck, though at one point the hydrostatic pressure was so great that sand was blown up for 30 feet. Total depth of well and bore, 420 feet.

The Aldborough Well, lying still further towards the centre of what I have called the Menindie area, after penetrating the usual clay strata, struck water at 200 feet in a bed of sand, which proved to be six feet thick, yielding a good supply; it was then sunk through six feet of blue clay, and the water, which at first contained red mud, welled up to the level of the first flow. The well-shaft subsequently caved in.

The Kars Well was sunk many years since, it is 210 feet deep, contains a large supply of stock-water, is in fine drift-sand, and has a powerful engine, with seven-inch pipe. No attempt, by boring or otherwise, has been made, as far as I can learn, to test the presence of other water-bearing strata below.

The Silistria Well, situated towards the eastern edge of the Menindie basin, is a very remarkable one; sunk, as usual, through the various clay strata. At 270 feet water was struck in the fine sand, and a bore 131 feet deep was put down through alternate layers of blue clay and sand, each deeper layer containing coarser sand, and at the bottom very coarse sand and water-worn pebbles were found. The water, immediately it was struck, rose up to the level of the bottom of the well, and the force was so great as to send up pebbles with it. The water had a distinct sweetish taste, but is palatable for drinking; it is the deepest water so far struck within the area.

On reference to the chart, a large, almost detached, area of the Newer Tertiary to the north-west is shown, and may be called the Topar area. Particulars of wells sunk here I have not been able to obtain, except that water in fine sand was struck at the well marked towards its western edge. Its distance from Broken Hill

is greater than the nearest portion of the Menindie area, but this basin may be worth further investigation, as the Sydney main line of railway to Broken Hill must traverse it, and so would supply fuel for engines to raise the water. This Topar basin, as charted, suggests isolation, but evidence in this direction is entirely wanting.

Another well in this area is Eckerdoon, but its precise location is not to hand. In both wells, however, the supply is reported as large, and, as far as my present information extends, of the same general character as the wells in the Menindie area.

The Cuthawarra basin is the furthest north, and is immediately south of the Archæan rocks on which Wilcannia is situated, they form the southern boundary of that Cretaceous area, which contains the valuable artesian wells of Queensland, New South Wales and this colony. The wells sunk in the recent clays of the Cuthawarra basin prove that at about 80 ft. below the present bed of the river the flood-waters are also stored up in the sand stratum. Mr. Geo. Riddoch, of Weinteriga, acting on this idea, found that as long as he was within this area he could, by using his aneroid, predict with certainty the depth at which the water would be struck. As a rule, the water is good stock-water. That it may be considered to be an isolated basin appears probable, as the geological chart shows the old rocks as closing in on each side; and that the river has cut-through between the eastern and western extension of these rocks seems proved by the existence of the Christmas Rocks some distance up river above Weinteriga Head-station, and one of the few rock-bars on the Lower Darling.

The sum of the evidences from all these wells proves incontestably that unlimited water-supplies exist at a very moderate distance from Broken Hill. I submit this is proved undoubtedly, as every well, although miles apart, has within a certain defined area invariably struck water at about the same level (allowing for the thickening of the clay-beds consequent on increased altitude), in similar strata, and of similar quality; whilst from the bore at the Silistria Well, the only one reaching the best water, which is at the lowest level, namely, 400 feet, the hydrostatic pressure was so great that pebbles were ejected with the water up to 130 feet. The Aldborough Well, as far as it went, furnished corroborative evidence, also does the Redan Well, which did not bottom to the lowest water-level. The many wells spread over so wide an area, all of striking uniformity, testify to the inexhaustible quantity of the water contained in what one may call a subterranean lake; the length of which is 140 miles as proved by the wells sunk in the eastern extension, across the Darling River. Its breadth north and south we cannot define, in the absence of exact data for the south boundary, but, taking it only as 50

miles, we have 7,000 square miles of water-bearing beds to draw from.

To render the waters stored up in the Menindie basin available for the Broken Hill mines, there are no insuperable difficulties, and the cost need not exceed some £100,000.

The fine drift-sand of the upper water-bearing stratum has proved the cause of serious loss and a very large expenditure. It was found impossible to maintain a sufficiently deep hole to receive the well-buckets, and the attempt to do so usually ended in the well collapsing sooner or later. The pumping-engines now employed have, on the whole, answered very well, but to reach the best and the deepest water, it is only necessary to use iron caissons, double lined, as used in the erection of bridges where mud and soil must be penetrated before reaching a sound foundation.

Before fixing the actual site for the well, a preliminary survey of the natural features would be advisable to select the best pipe-track and sites for the positions of a few bores towards the centre of the basin ; the bores will determine the most favourable strata for well-sinking, which could be done very quickly, as no stone or rock is to be passed through. A six-inch bore would be advisable, as the cores are certain to render valuable geological information. I should like to see a really competent consulting geologist engaged to report upon them, as it would add much to our scanty knowledge of the circumstances under which these wide-spread beds were deposited, and their relation to the period of deposition of the Murray Cliffs.

Now, as to the objection which has been raised as to the probability of the supply proving inadequate. Apart from the uppermost beds, where the water is slightly brackish, several others were passed through before reaching the gravelly beds, which contain the best water ; and in the only bore which reached them, namely, that from bottom of the Silistria Well, the hydrostatic pressure was so great that the pebbles were shot up through the bore to the bottom of the well, a distance of 130 ft. This unmistakably proves the existence of a very large body of water, and, added to this evidence, we have to consider the very large area over which these Newer Tertiary beds extend, the thickness of the various water-bearing strata, as well as the supply obtained from Kars and Middle Camp Wells (although both these wells are only sunk a little distance into the first of these strata) ; all of which circumstances demonstrate the practically inexhaustible character of these underground waters, and more than corroborate Mr. C. S. Wilkinson's views, expressed in a private letter to me some time after this paper was first written, but before

he was aware of its contents. The date is 25th June, 1891. "But a few miles to the south of the main road the Tertiary deposits become thicker, and form the undulating plains-country between the ranges and Menindie. In these deep deposits in places artesian water of good quality is likely to be obtained. The formations consist of the recent Tertiary, gravelly, ferruginous clays like those at Caulker's Well; then below these the Older Tertiary lacustrine lignite-beds, resting on the Older Tertiary marine beds, in which the best fresh water may be obtained; possibly some of the Cretaceous beds may underlie these. Several years ago I prepared a map for the Lands Commission, showing the probable extent of these older water-bearing formations, and advised the putting down of bores for artesian water to the N.W. of Menindie, on the Broken Hill road between the Darling and the outcrop of the slates." This very accurate forecast is completely verified by the facts above-mentioned. As to the possibility of the Cretaceous beds being found underneath the Older Tertiary, I can only say that up to the present, as far as I am aware, no evidence pointing that way has been discovered.

Annexed are two estimates of the cost of utilising the water for the mines at Broken Hill. The first is by an eminent mining engineer, and the second is by the representative of Messrs. Simpson & Co., the makers of the triple-expansion Worthington pumping-engines. Each provides for the delivery of 1,000,000 gallons per day on the mines, and the distance is taken at 26 miles, neither would exceed £100,000. And the enormous commercial advantages which are evident and may be grouped under the following heads, apply to all the mines more or less, though it seems superfluous to mention them :—

1. Concentration of the large bodies of low-grade ores will add very largely to the weekly output without increasing the cost of fuel.

2. Amalgamating kaolin ores, saving £3 to £4 per ton on some.

3. Leaching.

4. Making it possible to condense the fumes.

5. Water-jackets and boilers will last much longer.

Plate X

Plate X

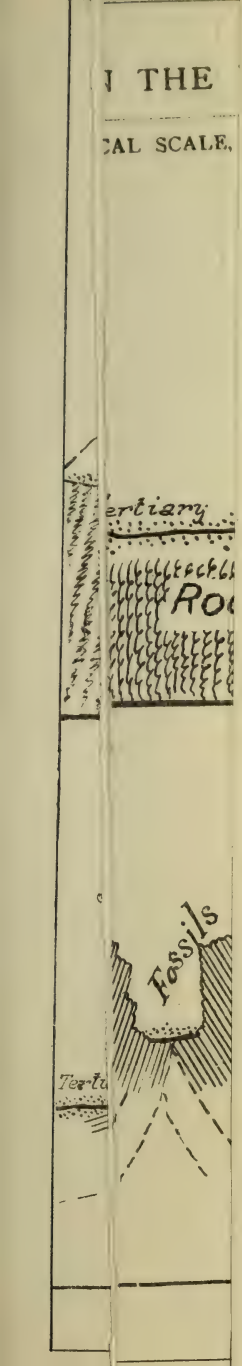
SKETCH PLAN
to illustrate Paper on
SUBTERRANEAN WATER SUPPLY
FOR
BROKEN HILL MINES
by
S. DIXON

141° 142° 143°
31° 31°

ARCHAEAN ROCKS

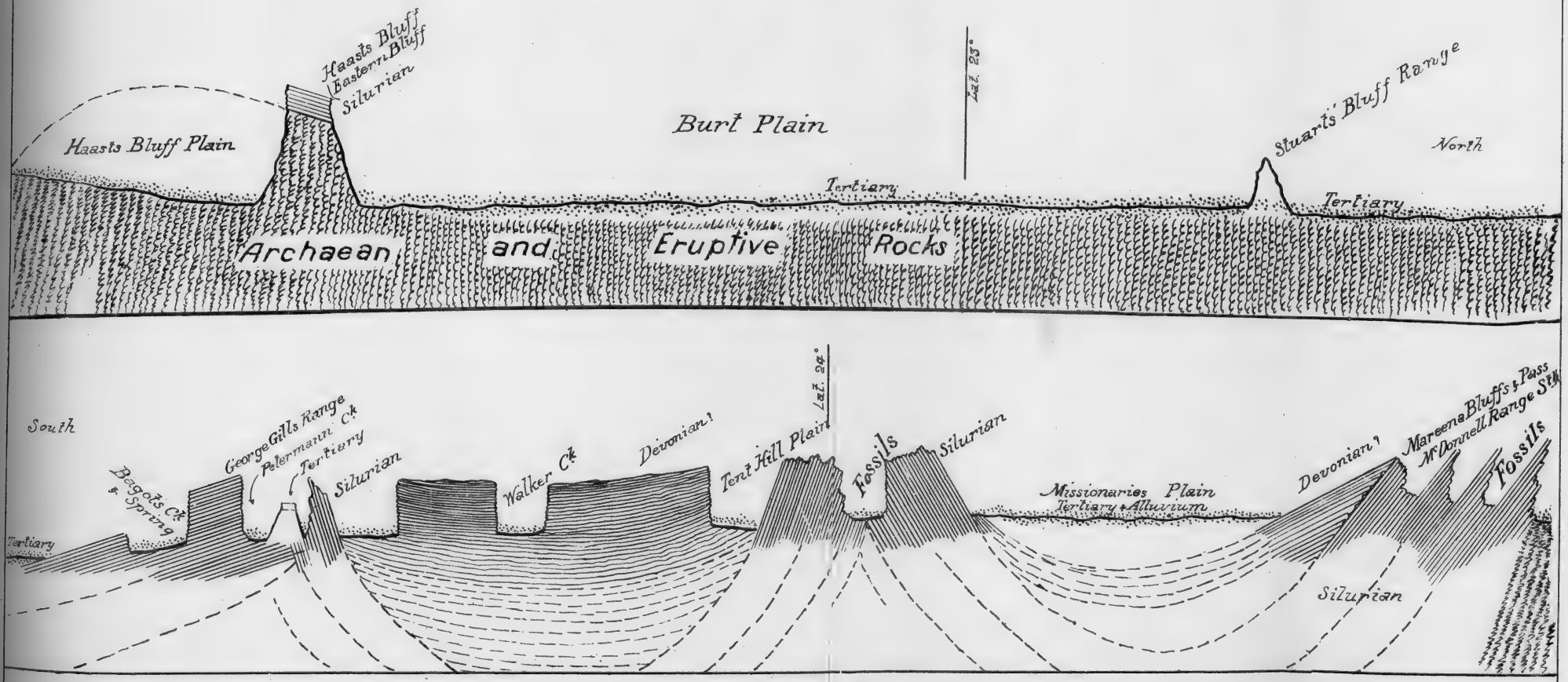
Eckerdoon
TOPAR
Mt Robe
Purnamoota
Yancowinna Creek
Mt GIPPS STATION
Silverton
Piesse's Nob
Mt Gipps
Topar
White Well
Stephens
Willyama (Broken Hill)
Thackaringa
Quandongs
Silistria
L
Horse L
Kars
Redan
Aldborough
Speculation L
Eaglehawk
Burta
Wanga
North Ita
Middle Camp
Nettlegoe L
Tandou L
Cawndilla L
New L
Kangaroo L
Emu
Menindie L
Menindie
Glenlyon
Spring Well
Adelaide
Narowie
SCROOPES RANGES
Canalpie
Black Hill
Pamamaroo L
Landare L
Tallawalka Creek
Darling
RIVER BEDS
Dolo
Calkers
Wilson's
Cuthawarra
Lake Woytchugga
Wilcannia
Terryawinnia L.
Eucalyplus L.
Waterloo L
Victoria L
Brommies
North
Ratcatchers
Dennys L
Boolabulkie L
Gum L
Sayers
Tanberry
NEWERTERRIA
Boundary of Colony
Oakvale 33°
33°
141° 142 143

Scale
0 5 10 15 20 25 30 35 40 45 50 Miles
12 Miles to 1 Inch.


Fossils

SECTION ACROSS THE MACDONNELL RANGES ON THE MERIDIAN OF E. LONG., 132° 1'.

HORIZONTAL SCALE, 1 INCH TO 5 MILES; VERTICAL SCALE, 1 INCH TO 1,600 FEET.



No. 1.

ROUGH ESTIMATE OF COST—THREE PUMPING-STATIONS.

2,100 tons 18-inch wrought-iron pipes (for 26 miles) ...	£53,200
Engines and pumps at well	4,500
Six pumps for stations (duplicates at three stations) ...	6,000
Stop, retaining, and relief valves and three feed-pumps	1,050
Boilers	3,100
Pipes and fittings to pumps	500
Erection of boilers, pumps, and buildings	3,500
Material, trenching, and laying pipes	5,000
	£76,850

Above prices f.o.b., exclusive of transportation and dams or tanks at stations.

No. 2.

APPROXIMATE ESTIMATES.

One well (400 feet deep), one vertical engine to pump into reservoir (to raise one and a-half million gallons in 24 hours from 270 feet); two horizontal triple-expansion engines (each to raise half a million gallons in 24 hours against a total head of 800 feet); four 96-h.p. boilers, traveller, feed-pump, &c.; engine and boiler-house, chimney-stack, and engine foundations; reservoir to hold 5,000,000 gallons, and all necessary valves (reservoir of stone or concrete)—for the sum of £44,500.

If a dam can be made the price above could be reduced to £28,500.

As there is abundance of clay in the country, we may take the

latter estimate	£28,500
Add pipes from first estimate	53,200
Laying pipes and material	5,000
	£86,700

Add to this freight for pipes to Port, and railway charges, and delivery on the ground, and railway and delivery charges for engines and pumps.

Consumption of coal six to seven tons per day.

The Aborigines of the Upper and Middle Finke River: Their Habits and Customs, with Introductory Notes on the Physical and Natural-history Features of the Country.

By Rev. Louis Schulze, Missionary.

(Communicated by the Honorary Secretary.)

TRANSLATED FROM THE GERMAN MANUSCRIPT BY J. G. O. TEPPER.

[Read April 7, 1891.]

CONTENTS.

I. The Country.

1. Physical Features and Soil.
2. Climate.
3. Natural Products—
   a. Minerals.
   b. Plants.
   c. Animals.

II. The Aborigines.

1. Physique and Diseases.
2. Mental Capacity.
3. Character.
4. Social Life—
   a. The Eight-class System.
   b. Tribal Marks or Totems.
   c. Arts.
   d. Dress.
   e. Ornaments.
   f. Dwellings.
   g. Food.
   h. Visiting.
   i. Sorcerers.
   k. Gesticulation.
   l. Vows or Oaths.
   m. Murderers.
5. Family Life.
6. Government.
7. Religion.
8. Superstition and Witchcraft.

I. THE COUNTRY.

1. Physical Features and Soil.

The basin of the upper and middle River Finke is situated between the 23° and 25° S. lat. and 132°-134° E. long. It is an undulating plateau, gradually rising from north to south, and crossed by two main ridge-like ranges. There are several minor ones as well as isolated mountains, as, for example, the Waterhouse Ranges in the east, the Gosse Ranges in the west, &c., but which are virtually offshoots of the main chains. The northern range, called *Merena* by the natives, is the more lofty, its highest peak being said to be 3,800 feet above sea-level. At a distance, when viewed from the south, it presents a majestic appearance, but on a nearer approach this impression vanishes, owing to the gradual elevation of the intervening country. This range forms

the watershed of the interior of Australia, the streams flowing north on one side and south on the other. The River Finke, with a mainly south-easterly course, together with its tributaries—namely, Rudall-Creek, Ellery-Creek, the Hugh, the Todd, &c.—take their rise here, but not from springs. Though there are a few springs in this range as well as in the southern chain, they do not produce an overflow, but form swamps or ponds. Even when in winter the water does commence to run, the stream, after a course of a few hundred yards, is absorbed in the sand. It requires heavy continuous rain to produce a steady flow. Dry sandy water-courses are the prevailing characteristics, studded with Eucalypts or shrubs. The waterholes after a flood offer a welcome change, but these in time gradually dwindle and disappear during long-prevailing droughts. At these localities, however, water may be obtained by digging. The tall Eucalypts furnish the clearest indication of a water-course, both as to its channel and overflow; for this latter may be up to half a mile wide, or over a mile at some places, and is always overgrown with these trees. They are generally at a distance from one another, but in a few places form a close forest.

The southern chain, or Krichauff Range, here usually called the James Range, and by the natives *Ulamba*, is much broken in some localities, like the northern one, the highest point rising to a height of about 1,500 feet. It is crossed by the Finke River and several of its tributaries descending from the MacDonnell Ranges to the northward. Its own waters run into the Finke River in larger and smaller river-beds. The largest of these is the Palmer, with its tributaries descending on the southern flank with a south-easterly direction. On the largest of the latter, the Walker, a few miles above its junction, is situated the cattle station Tempe Downs. Where the Finke River enters the range is the Mission station—Herrmannsburg. Some 40 miles east, at the entrance of the Hugh River into the Waterhouse Range, is the Owen Springs Station, and in the eastern part of the MacDonnell Ranges, on the River Todd, are the well-known Alice Springs.

The scenery in the MacDonnell, as well as the Krichauff Ranges, is at some places most striking and picturesque. The finest of these is along the course of the Palmer River in the Krichauff Range, about 10 miles from the mission station, Herrmannsburg, where there are hundreds of Fan-palms, whose slender stems, a foot in diameter, rising straight and tall, bear aloft a beautiful, globular crown of leaves, some 30 feet in diameter. Within both Ranges are plains, overgrown with bushes like those of the elevations and outer plains around. After heavy rains good grass grows in places, but most of it is

covered with Porcupine Grass, *Triodia irritans*, or other species, which is feared by all creatures. In places the Porcupine Grass extends for miles, resembling in appearance a waving field of corn. The soil is chiefly a red-colored loose sand, blown into hills and even chains of hills, between which extend plains of dark-grey loamy soil. Extensive limestone rises are also seen. The soil is passable, but the rainfall is too scanty. After rain herbage grows upon the red sand and the limestone hills, wherever the Porcupine Grass will allow it. The plains, however, are the most fertile.

2. Climate.

A clear sky, bright sunshine, very great heat, and long-continued droughts usually prevail. The idea of the four seasons in equal proportions is scarcely applicable here, for both spring and autumn may be very hot. The hottest months are December, January, and February, the last two being the worst, as the heat then continues day and night with hardly any intermission for two or three weeks. The temperature rises usually to 112 deg. F. in the shade of our reed-thatched verandah, exceptionally even to 115 deg. F., and sinks often scarcely below 90 deg. F. in the morning. After sunrise it again rises rapidly, and is frequently above 100 deg. F. at 9 a.m., and the same at sunset. In the spring months, viz., October and November, the heat is often as high as 110 deg. F., but lasts only three days, being produced by the north-west winds. The pleasant south-east wind then prevails for several days until again overpowered by the former. The north-westerly wind usually fills the air with dense clouds of dust, making things invisible at a hundred yards distance. The south-easterly wind acts frequently in the same way, but minus the excessive heat. In April and May the same winds prevail, but are not as strong.

The pleasantest months are May, June, July and August, which may be termed the winter months. If it begins to be chilly in May, the two last months are usually mild and warm, but if the cold sets in during July, this month and August are the coldest. The thermometer sinks then at night to a few degrees below 30 deg. F., as low as 20 deg. F. occurs rarely. The thin ice formed at night begins to melt soon after sunrise, but remains frequently till noon in shady places. The south-east wind is often raw and disagreeable at this period, even by day. Snow is not known to have occurred here, but hoar-frost is sometimes observed in calm weather. Excessive perspiration day and night during the long-continued heat renders the body weak and sensitive, so that the cool or cold weather is felt very severely. Catarrh prevails at this season, although it is the time for recoup-

ing the exhausted system enervated by heat. The natives also divide the time into four seasons, not according to months, but simply as regards the temperature prevailing. The cold period they call *lurba* and *lurbaka* ; the next following *mballagata* ; the hottest season is termed *mballaka* and *albolbuka*, and the succeeding one *lurbagata*. Rain is the rarest phenomenon, not pertaining to any particular season. The usual signs are illusionary, or frequently it seems as if a downpour was about to take place, but a few drops may only fall, most of the turmoil consisting of wind and dust accompanied with flaming flashes of lightning and crashing thunder-claps. During the 14 years of our residence here, soaking rain, causing the water to flow, and also droughts have occurred in each season, but the summer months are mostly the wet months. There have been also summers without any, not counting passing showers, which are of little use in this country ; they neither add to the water supply, nor produce feed, simply cooling the air for a few days. Rains from the south lower the temperature, being followed by cool south-east winds for some time. These, in winter, are certainly often disagreeable. Only the heavy showers during the warm and hottest seasons produce any growth of grass, especially, if followed by lesser showers at comparatively short intervals. Without these latter, the growth of grass remains poor and scanty, and occurrs only in protected localities. Should the rains fall during the months of April, May, June and July, as, for example, in the year 1889, nothing will grow after them, however copious they may have been. Rain scarcely ever occurs but as showers during thunderstorms.

The duration of the flow of the water in the river-beds depends upon the magnitude and duration, and quick succession of the floods ; a single flooding soon passes off, notably in the middle of summer, whilst another soon following, the flow is more continuous, especially in winter. The longer the drought lasts, the salter and more bitter becomes the water in the waterholes of the River Finke. While the water of our wells remained fairly good for many years, it became quite bitter and undrinkable after the winter-floods in 1889. It was also useless for watering the gardens, so that few plants remained alive, and even moderately large almond-trees succumbed.

Whirlwinds are common. At the change of the wind many, and some even of colossal magnitude, may be seen rising high-aloft, whirling upwards all loose grass and brush together that is encountered in their path. On the other hand, mirage is a rare phenomenon, visible only at a few localities, and not nearly as marked as further south upon the large saltbush plains about Farina, Hergott, &c.

3. Natural Products.

a. minerals.

How rich or poor in minerals this region may be the near future will show. For several years past they have been eagerly searched for, especially in the MacDonnell Ranges, and thousands of pounds have been spent in this pursuit. The Krichauff Range does not appear to contain anything but red sandstone and iron-ore. In the eastern part of the MacDonnell Ranges there are already a large number of gold-diggers, and some fine nuggets are said to have been picked up. A few years ago there was much excitement about the discovery of rubies, but they proved to be garnets. At present the mica of this region engages the attention of prospectors on account of the large size of the plates procurable.

b. plants.

In consequence of the scanty rainfall and the ever-recurring continued droughts the vegetation is meagre, but after copious rains the display of flowers of the herbs and shrubs is magnificent. It is only a pity that it occurs so seldom. There is a large variety of plants, but few of great size or luxurious aspect, and only a few trees. The most common of these latter is Red-gum (*Eucalyptus rostrata*), growing in the river-beds, where it attains all sizes up to a hundred feet high, and six feet in diameter, but giving little shade on account of the sparse foliage. Many of them are crooked or hollow, but some are straight and sound. Their timber is more or less durable, according to age and position. A less common tree is the Beefwood (*Grevillea striata*), which occurs either singly or in small groups. It may attain a size of fifty or sixty feet in height and two feet in diameter. The bark is rough, with immense cracks, mostly black; the leaves are a quarter of an inch broad by a foot long; the wood resembles beef in aspect, hence its name—*beefwood*. The majority are sound and healthy. The Desert Oak (*Casuarina Decaisneana*) has mostly a slender, straight stem about twenty feet high and one and a half feet in diameter; the bark is rough and cracked; the branches, with their cord-like twigs some ten inches long, form generally a pretty round top, but do not afford much shade. The main or tap-root appears to descend as deep into the ground as the tree ascends above it—at least, this is the case with the small trees. It grows either singly or in groups, and forms occasionally forests on the sandhills in a few localities. The wood is white outside and brown within; it splits easily, and while fresh is easily worked, but when dry becomes very hard. In water it lasts better than *Eucalyptus rostrata*. With it all the wells have been timbered, and it was found very suitable for

beams. The Pine (*Callitris verrucosa*) grows here and there in the ranges, and remains low and small, on which account it is unsuitable for timber. The Fan-palm (*Livistonia Mariæ*) only occurs in the Krichauff Range, and at one locality some eight to ten square miles in extent, where it grows in the beds of the Finke River and some smaller water-courses coming from the north-west. It overtops all other trees. The wood is stringy, like straws compacted lengthwise, and is very light when dry. The fruits are of the size and form of bullets, and as hard as stone. Most of the interior consists of endocarp, covered with a thin skin. They form an immense grape-like cluster, which springs from between the leaf-stalks, and hangs down like a mistletoe. The leaves consist of a flat stalk ten to twelve feet long and some two inches wide, with short spines on both sides, and bearing at its extremity a fan of leaflets some five to six feet long. The Grass-tree (*Xanthorrhœa*) grows at a few places on the sandhills, its trunk attaining a height of about six feet and a diameter of one foot. The cord-like but quadrangular leaves of about three feet in length grow from the summit and hang down like long hair, a cylindrical fruiting-scape rising from their midst to about seven feet and about one inch thick. The bristly head of leaves, with the solitary black scape rising above it, give to these trees a weird, fairy-like aspect in the midst of fields of the forbidding Porcupine-grass, especially when seen for the first time at night. All other ligneous plants growing on the sandhills, plains, water-courses, or in the ranges form only low or moderately-tall shrubs, with the exception of the Mulga (*Acacia aneura*), which attains to the size of small trees. At some places the thickets formed by the shrubs are so dense that they can scarcely be penetrated. Formerly bush-fires occurred frequently, but since the introduced stock has fed off the grass they have become less prevalent. Of fruit-bearing trees and shrubs there are none according to European ideas or taste, but many from the native point of view. All these fruits have either too much of the stone and scarcely any fleshy part, or else possess a too-acrid or acidulous taste. Of cultivated plants, figs grow fairly well; all others will not flourish. The Date-palms also grow very well, but how they will fruit time alone will tell. Various culinary vegetables thrive indifferently, but cauliflower excellently. The reason for the ill-success of the gardening efforts is to be sought for more in the bad water of the Finke River than in the climate. After rain many plants grow well, even during the hot season.

c. ANIMALS.

All domestic animals, such as horses, cattle, sheep, goats, pigs, dogs, fowls, &c., have been introduced by Europeans, and do very

well. During the long-continued droughts many of them die through want of feed. The dryness, and consequent poverty of the country, is also evidenced by the indigenous fauna. There are no large representations of it besides Kangaroos and Emus. Of marsupials, the largest is the Kangaroo, called *Arira* by the natives; the second in size is the Uro, with the native name *Aringa;* the third is the Rock Wallaby, or *Aroa* of the aborigines. Besides these there are others known by the following native names:—*Inmora*, *Kwalba*, *Iwuta*, *Kweba*, *Tnunka*, *Putaia*, *Mota*, *Antina* (the common Opossum), *Tjilba*, *Gurra* (probably the Long-nosed Pouched Badger, *Parameles nasuta*), *Tatja*, *Ruartja*, *Tokia* (certainly the Garden Dormouse, *Myoxus nitella*), *Lukura*, *Inalinga* (the Ant-eater). There is besides the marsupials the Native Jackal, commonly called "Wild Dog," but by the natives *Knulja;* and a kind of cat, termed *Lukaringa* by them.

Of reptiles, the Lizards and Snakes are represented in fairly large numbers. The natives have names for at least nine different kinds of lizards, of which the largest, *Tjunba*, is about eight feet long, and 22 inches wide from one foot to the other. The others are called *Loatjira*, *Ntjira*, *Baliaka*, *Irbanta*, *Takinjara*, *Rena*, *Ngenäurbarana*, *Ntarita*. Snakes, called *Apma* by the natives, exist here in great numbers, of various colors, and of considerable sizes, up to the thickness of an arm and a length of eight or nine feet. The natives have names for 22 kinds, viz., *Laltacalbula*, *Ilumpalatnina*, *Lanjararintunana*, *Njuritja*, *Kapiltaringa*, *Menkaltarina*, *Latuara*, *Renina*, *Ulpopana*, *Warankula*, *Ilparalea*, *Lalpalanana*, *Erulangalanana*, *Baraloatjira*, *Gulaia*, *Gnaringa*, *Rata*, *Ilbaraba*, *Rumburunga*, *Putamanina*, *Erakurkargina*, *Ntadirka*. Most of these are venomous.

The voice of frogs is heard very rarely, still more rarely are they to be seen. They live in the sand, and only appear above ground after rain, and then exclusively at night. Their voice resembles more the bleating of a sheep than the croaking of European frogs, and many new-comers are deceived by it.

The fishes are called *Irbunga* by the natives, who name nine different kinds, viz., *Antabikua* (as large as a herring), *Longulbara*, *Ntamantana*, *Arumunta*, *Babababa*, *Renginga*, *Ltemba*, *Raltaralta*, *Kwalbila*, and *Ltjauma*, the last being really crayfish, but which they do not eat.

Birds of great variety, of all sizes and colors, are to be met with here, especially after continued rain and subsequent floods. The largest bird is the Emu, called *Ilia* by the natives. There are also some wild Turkeys, which the natives call *Itoa*, and a few Pheasants, for which the native name is *Ngamara*. While the Emus and Turkeys lay their eggs upon the ground, the

Pheasants place theirs deep in the sand, for which purpose a hole is scratched out and two eggs deposited, and covered over; a little distance away it does the same, and so forth until finished, the sun effecting the hatching. The young ones appear in pairs above ground, and at once commence to search for their food. The Emu hen gets her eggs also hatched by the sun, but she takes a good deal of care of them, and when hatched takes the young under her protection, and they follow her about. The Turkey acts in the same manner, but appears only to lay one egg; the young one she takes about with her by carrying it upon her back. The food of the Turkey is gum secreted by various trees and shrubs, and caterpillars of the nest-building kinds; the Pheasants eat snakes, &c. Pigeons of various sizes occur almost everywhere; and the red-legged Water-Hen is also found here and there, besides Ducks, Pelicans, Spoonbill-Geese, Snipes, &c. Black and white Cockatoos are not wanting either, and fill the air with their discordant cries. Most plentiful of all are, perhaps, the various parrot and sparrow-like birds. For all of these the natives have names, amounting to about 43 kinds in all, among which are several Hawks. Nor must we forget the Crow, which can endure frost and heat. There are also a considerable number of night-birds, such as Owls.

Caterpillars of various kinds sometimes infest the country, especially after rain. A peculiar kind, called *Weba*, is a favorite article of diet with the natives. There are also various species of beetles and other insects. One species is a favorite food of the natives, who call it *Alknenera*. Wherever *Eucalyptus rostrata* occurs, the latter (a species of cicada) come out of the ground, have leathery wings, and are larger than cockchafers. The males have a sort of drum on each side, connected by a channel across the underside, the whole being covered by a valve, through the opening of which they produce a continuous, shrilly vibrating noise.

The flies here are very bold and importunate, like angry bees, and can scarcely be kept off, especially attacking the eyes.

The mosquitoes are also sometimes a great nuisance; and spiders, centipedes, scorpions, ants, &c., abound, but their venom does not appear to act fatally, although causing great pain.

II. THE ABORIGINES.

1. Physique and Diseases.

There is probably scarcely a country where the aborigines are so few in number as in Central Australia. Sometimes one may travel for days without meeting a single one. During our resi-

dence here they have become considerably reduced in number. The causes are various, as for example, the incessant murders for the sake of revenge, few births, and being shot down. Of the last, several cases came to our knowledge in years gone by, and we have also been told by white people, and especially by the natives themselves. Latterly nothing of the kind has occurred.

Their hair is not woolly, like that of Negroes, but straight; in a few cases the ends are slightly curled; it is dark-colored, and but rarely fair. In a state of nature it hangs down uncombed and confusedly, hence their repulsive appearance. Usually they tie it up into a top-knot with string made of the hair of rats, so that it forms a sort of a short thick queue. Being anointed with grease, covered with dust, and unkempt, their hair gets matted into ball-like masses. A few have fine beards and whiskers, but the latter is generally the best developed. As though under some solemn vow, they will allow no razor to touch their beards. The moustache is cut, but formerly, whilst this was being done, they held fast their hair and beard with both hands. The mouth is wide, the jaws somewhat prominent, but not the chin; the lips are certainly thick, but not nearly so protruding as those of the Negroes; the forehead rather recedes backwards; the upper part of the nose is depressed, causing the lower forehead to project, whilst the tip is broad and thick, and the round nostrils are widely separated. The cheek-bones are prominent, and the eyes are sunken, the white parts being dull and of a bluish tinge. The body on the whole is slender and well built, although there are a few who are stout and broad.

Blind and half-blind persons are numerous, caused by eye-diseases, which prevail at the change of the season after the great heat. The halt, and the deaf and the dumb, are also to be found. A kind of climatic fever prevails usually at the end of the summer, which prostrates one after another. The scars on the faces of some afford evidence that smallpox affected them some 16 or 18 years ago. They call the disease "*Pania.*" Some are said to have died of it. Little children are often subject to diseases of the throat, which prove occasionally fatal. The worst disease among the natives is syphilis, with which everyone is more or less tainted. From the first we have had to treat this disease, and several of the natives have died of it. The disease appears to be becoming more prevalent, due probably to general prostitution. Owing to this disease few children are either born or are then so delicate, that when grown up they have not the stamina of the white inhabitants, though the latter are exotics to the climate. There is certainly no great future for this people.

2. Mental Capacity.

The mental capacity of these aborigines is not in any way equal to their physical development. Indolence and laziness are their greatest faults, and the cause of many others. This is due partly to the poverty of their country, which, by causing tillage of the soil to be an impossibility, forces the natives to depend upon the wild and precarious life of the chase. Rightly a German proverb says, "Fishing and bird-catching spoil many a fine youth." Such hunting and rambling about in the bush kills all mental activity, and lowers man to the level of the beasts. These aborigines have mental capacities, but they are lying dormant. It is only necessary to develop these, and to show them the use and advantage of so doing, but, unfortunately, there is nothing on which they can exercise their talents. What advantage can it be for a youth to learn if he has no prospect of obtaining a position corresponding to his attainments? No, he must remain as he was! Must not this produce indifference? One finds, therefore, their talents weakly developed because unused throughout their life. To reflection they are quite unaccustomed. To train them to reflect, or to habituate them to think, requires a great deal of trouble. This we have especially experienced in our linguistic labors and in the literary work now in hand. The concrete is comparatively easy to them, but as soon as the abstract is touched upon it is impossible to keep their attention even with the greatest patience and effort, for they deviate in all directions. Asked for the reasons of their social and religious customs, their final reply is "*Wara*"—*i.e.*, "Our habit; nothing else." To such habit their whole rites have been degraded, so that they themselves do not know rightly why they do it, and are incapable of explaining. This is also the reason of the difficulty of discovering their motives, and caused the investigation of their social regulation in respect of their Eight-class system to be so troublesome. Information can only be obtained by accumulating many examples from their actual life, and then directing their attention to them. For such mental work they have no inclination, and would much rather do some hard bodily work. They take the greatest pleasure in riding horses. It is rather difficult for them to comprehend arithmetic, yet we have advanced several scholars so far that they can do the four rules of arithmetic without error, an indication that they are capable of some mental culture.

In their own language they can count to four only, viz., One, *ninta;* two, *tera;* three, *tera ma ninta;* four, *tera ma tera.* After these they have *urbutja*, some; *njara* and *knira*, many; and finally, *kniranjara* or *hyaraknira*, very many. The number of their own fingers they cannot count accurately, and they have quite a different idea of numbers and things to ourselves. If

they have seen 10 emus, for example, or 15 or 20 strangers approaching, they say in either case "*njara knira bitjiririma*," "very many are coming." This is quite natural under the circumstances. Many contradictory elements are found in their religious views and habits. It never occurs to them to reflect about this. If their attention is directed to them, they smile complacently, and continue to adhere tenaciously to that which is customary. In their domestic affairs their want of reflection is also exhibited. The saying "Take not thought for the morrow, &c.," is unnecessary advice to give them. At times grain is plentiful, but to store any for the future never enters their minds, or that a bad season will follow a good one. Similarly the idea of a life after death gives them no trouble, owing to the abeyance of their reflective faculties. Many a time we have warned them not to kill cattle, and yet they could not resist the temptation, ignoring the consequences. Many a time have we also warned them against the murders for revenge, and showed them that ultimately they must fall themselves as victims, but with a similar result. The word of God alone can produce a change here, as we have with some, who placed themselves under its rule; no external culture can do it. Therefore more mission-stations should be founded, and the native induced to reside there; that alone can save them bodily and spiritually. Hours, even days, they can sit stolidly in the shade of a tree, or lie there, without getting tired, humming at times to themselves. To explain spiritual matters to them is not easy, especially as there are not words to express the ideas, and will have to be coined for the purpose. To learn the meaning of these they find exceedingly difficult, and only a few can master it with effort. Their memory is good, and exceeds that of many white people. They are quick at learning by rote, and retain anything they have heard, learnt, or experienced. For music and singing they have a good ear, and they easily pick up a tune. Some have also good voices, and use them, but others are too lazy to exert themselves to sing. Their aboriginal songs are very monotonous and monosyllabic. To learn and sing them requires neither trouble nor application. Perhaps this explains their liking for extending their singing performances till late into the night; even children thus sing at their games. Usually they beat time to it with their hands, or slapping their bare legs, or with their *tnuma* (short stick) upon a trough. The tone moves from quinte to quinte monotonously. If, for example, they have repeated the stanza several times in the high *d*, they sing it again several times in *g*, after this in low *c*, and then begin again at the high note, and so *ad libitum*. The whole stanza consists of three to five words, which are endlessly repeated until they change it for another to the same tune. The burden of

these stanzas or verses is either a prayer to save them from some disease, as "*Antaba tarta potinga!*" *i.e.*, "Headache quiet become!" or, "*Aralba pananaia!*" *i.e.*, "Dry up smallpox!" or a prayer for "*tjurunga*," or food substance, or some such object. Popular songs they have none, for the simple reason that they are deficient in popular sentiment; nor heroic songs, because there are no heroes among them. Their perception is, like that of all children of nature, of no mean order. To describe an object according to its external form, color, and properties is easy for them, and they can mimic speech, actions, and other peculiarity. Their *tjurunga*, corroborees, are mostly animal-*tjurunga* (feasts?); thus at an Emu-*tjurunga* they imitate exactly an Emu in all its movements. The paintings of their bodies also represent mostly animals, such as snakes, frogs, &c. Although only able to count up to four, they can individualise large herds of cattle or horses, and can tell at once if one is missing, and which, and what its color or appearance may be. In tracking they are great experts, perhaps equalled by few. They can tell fairly well how old the track is; and distinguish that of every man and animal from that of others. Where nothing is apparent to us they follow without hesitation. The imagination is largely developed. Not only by night do they fancy they see and hear all sorts of things and sounds, but even by day—the offspring of fear. Thus they tell of nocturnal spies, which one or the other fancies to have seen or heard. If requested to show the tracks, they say that these walk without touching the ground. They will even name those they fancy to have perceived. It has happened several times in broad daylight that they have come to report that yonder were *tnenka*—*i.e.*, enemies! These proved to be either animals or only bushes. They can make fanciful comparisons, as, for example, the names given to several heavenly constellations. The Southern Cross they call "*Eritjinku*"—*i.e.*, eagle or hawk's claw. The Milky Way they term "*Ulbaia*"—*i.e.*, water-course. The sun is for them a woman with a great firestick; when she puts on much wood the fire blazes up tremendously, and begets the excessive summer heat. In the evening the sun-woman passes under the arm of an old woman, and becomes invisible. Her nourishment consists of grubs feeding in timber. The moon is an unsexed male, and called "*Atua*." As the new moon, or young man, they view it rejoicingly, and call each other's attention to its appearance. He feeds on opossums, which causes him to get so round and full. Then he gets old, becomes attenuated, and disappears in the ground. The stars are distant fires.

3. Character.

The natives are deficient in courage, and commit their revenge —murders only—by stratagem, waiting and spying till they can

surprise their enemy alone at night. They are afraid to engage in open combat, or if they do, they must feel themselves superior in strength. The most innocent sounds may be productive of fear and trembling, through their imagination. They are easily roused to great anger, when they will scold and abuse each other for days, or even beat and wound with spears, but the latter only by piercing into the thick muscles of the thighs. To prevent such a quarrel ending fatally, the rest interfere, when necessary, armed with their spears. At other times they will sit comfortably together and tell tales. They consider the aged, sick, and infirm members to a certain extent, and supply them with food and drink if not requiring too careful and tender treatment; but otherwise they may precipitate the end by their inconsiderate action during outbursts of sorrow and grief.

They can also take pleasure in being extremely cruel. They may beat some at times to death. Their enemies they spear in places where the wound is not speedily fatal, break off the shaft, and push the barbed end still deeper into the body; they then scorch the wound and adjacent parts with a firestick, to induce people to think the person had been killed by falling into the fire. They can also be tender and kind, carrying wounded comrades, &c., carefully in their arms or on their backs.

The natives are also hospitable. When visitors arrive in camp they give whatever they have. Everything conducive to sociability and amusement they cultivate and practice as much as they are able. They do not care to be much alone, but sit together for hours and days, chattering about nothing in particular, or lewdly, even in the presence of children, without a thought or a care. They are fond of numerous visitors, and of returning their visits.

Courtesy is not unknown among them. They salute each other by striking the thigh several times with the palm of the hand. When strangers pay a visit they do not enter the "*tmaruna*," camp, at once, but sit down at some distance and wait till someone comes and takes them in; if there be no man at home, the oldest woman performs the ceremony. If a larger number arrive in company, the whole "*tmara*," camp, becomes agitated. In solemn procession they go to meet them, with their weapons in their hands, approaching in serpentine curves, and performing all sorts of bodily motions, while the visitors stand still, the spears placed before them, the point directed upwards. After saluting each other they sit down and chat.

In regard to living, the natives are quite thoughtless, never heeding the future. If they have something to eat, they feed until it is finished. Some can devour three-fourths of a sheep at

a sitting, and drink in proportion. On the other hand, they can fast for a considerable time, and only when hunger compels will they leave the camp for a fresh supply, and if they cannot get anything else, are satisfied with the toughest roots.

They are heedless, and cannot be depended upon. If not constantly supervised something is sure to be done wrongly, left behind, lost, or wasted. If scolded they laugh, and do not understand the value of time or things; if their huts burn down they make merry over it.

The laziness of the natives is great. To get them to work is difficult; and still more to keep them at it. Directly one's back is turned they either sit or lie down, or disappear altogether. They consider it a great favor to give the smallest aid. To beg they are not ashamed, but annoyed if they do not get what they want, calling the person a miser.

Lying, cheating, envy, bearing illwill, having ambition, and being conceited, are by no means unknown emotions amongst them, but they lack generosity and nobility of mind. Their rule is, "Eye for eye," &c., and if one only employs a chiding word, or gently strikes the unmannerly child of another, it is resented at once, and paid back with interest.

The natives respect an oath or solemn promise. They have a certain idea of adorning themselves, but their tastes differ from ours. To beautify themselves they rub their bodies with grease to make the skin shine, and try to ornament it by painting, and the application of tufts and cords. Nor do they take equally to all, hence arise connubial quarrels.

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4. Social Life.

a. the eight-class system.

The social as well as the family life of this people is largely governed by a system of eight castes (classes), which forms the basis of all degrees of relationship among them, and they, therefore, adhere with great tenacity to it. That there should be any deviation or change in this is quite incomprehensible to them, as that would force them out of the old routine into a new and strange course, which is entirely beyond their horizon. All the eight classes are co-ordinated among each other, neither more nor less privilege appertaining to any. With respect of marriage, this is always between a prescribed pair, thus forming four pairs of classes by prescription, although eight by name. The following synopsis shows which classes may intermarry, and to what class the children of the four pairs belong:—

Males.		Females.		Children.
Beltara	...	Gomara	...	Bunanka
Pungata	...	Mbutjana	...	Knuraia
Gomara	...	Beltara	...	Purula
Mbutjana	...	Pungata	...	Ngala
Bunanka	...	Purula	...	Beltara
Knuraia	...	Ngala	...	Pungata
Purula	...	Bunanka	...	Gomara
Ngala	...	Knuraia	...	Mbutjana

The rule is that those who stand on the same line marry first, but under certain circumstances marriages in a diagonal line are permitted to take place, for example, a *Beltara* may marry a *Mbutjana*, and a *Pungata* a *Gomara*. But whether the *Beltara* has a *Gomara* or a *Mbutjana* for his wife is immaterial to the classification of the children, who are *Bunanka* according to paternal descent. The same rule applies to the other classes. That two classes have the right of intermarriage, I think may be accounted for in the following way, viz., that formerly this people had been more numerous, when class intermarriage was not allowed. But when subsequently it became much reduced in number, one class may have contained only a few men, and the other a few women, they then resorted to this relaxation of the rule to avoid extinction, and permitted intermarriage between two definite classes. At present their numbers are so reduced that, even with this, marriages can scarcely take place within the prescribed limit, especially as many white people attach to themselves native women. Polygamy makes wives still scarcer, as some men acquire two or three. A bachelor has, therefore, to wait until he is lucky enough to get a wife, *i.e.*, until some *rendera* or *gamena* gives him his daughter. The *gamena* can only do this when the aspirant is not the brother of his mother. For if his mother is not from the direct line, but the indirect one, he calls her brothers also *gamena*, and may not marry her daughters.

Among Christians the family is formed by the various degrees of consanguinity; among these natives it is constructed on the class system. The family is supported by it, or rather born out of it; for a youth has not the right to choose a bride for himself, but must take the one selected for him by some *rendera* or *gamena*, as stated above. He makes no demur at this. Such a marriage only gives rise to a few new degrees of relationship. Neither the man nor the woman assume any new title, the connubial relationship being only indicated by affixing the word *iltja* to the names, while the affinity of the class is denoted by the affix *lirra*. Thus *noa* means spouse or partner; *noa iltja*, real spouse, with whom he cohabits. Again, *kata* signifies the father of the class; *kata iltja*, sexual father. Ordinarily they leave out

the words *iltja* and *lirra*, and do not use them, because they all know among themselves who is personally related, and who is not. They are only used casually when conversing with strangers, to whom they wish to explain their family relationships. For the slightest difference in affinity the natives have distinctive names, which are also employed in the family. Thus all persons belonging to the same class (even if they, according to our ideas, have no consanguinity) call themselves *arumbinjara* and *itiinjara*, which means something like brothers and sisters. The younger one says *arumbinjara*, the elder *itiinjara*. If only two be present, the younger says *arumbananga*, "we both (are) brothers (sisters);" the elder *itiananga*, which means the same. The elder brother and sister call the younger brother and sister *itia*, while the younger brother and sister call the elder brother *kalja*, and the elder sister *kwaia;* besides this the younger brother calls the elder sister *arumba*, and the younger sister the elder *nkura*. The younger brother says, therefore, "*kananga*," (we are) two brothers, or "*kananganganga*," we (are) brothers; the elder says "*itiananga*," (we are) two brothers; or "*itiinjara*," (we are) brothers. Similarly the elder sister expresses herself in respect of the younger sister or sisters, but the younger one, on the contrary, says "*nkurananga*," or "*kwaiananga*," we two (are) sisters; or "*nkurinjara*," or "*kwaiinjara*," we (are) sisters. These examples will show how they indicate by separate names certain differences, which we cannot in our language without employing several explanatory words. Accordingly, their relationships are very complicated, so that even the cleverest among them are often unable to find the right answer. Only by instances from their own life can this be rightly inferred, and one must be, therefore, quite accurately informed before one can determine their family relationship.

In the following synopsis a *Bunanka* man and woman is taken as an example of the nomenclature of all the classes. The same terms are used by the other classes, but, of course, in their proper application, as will appear from the table:—

Bunanka-men call the

Bunanka-men: the elder, *kalja;* the younger *itia;* the very old, *arenga* and *katatama;* and these the same, *arenga* and *katatama*.

Women: the elder, *kwaia* and *arumba;* the younger, *itia;* the very old, *lora* and *lorebmana;* and these the same, *ebmana* and *arenga*.

Knuraia-men: the elder, *ebmana* and *kaljebmana;* the younger, *ebmana;* the very old, *arenga* and *katatama*.

Women: the elder, *kwaiebmana;* the younger, *ebmana;*

the very old, *ebmana* and *lorebmana ;* these the same, *ebmana.*

PURULA-men : each other, *mbana ;* when father's sisters' children, *i.e.*, if their father be a *gomara*—each other, *ankalla, kalja* or *itia ;* when a *Mbutjana—tjimia ;* the very old call each other *katatama.*

Women : each other, *noa ;* the very old, *lora* and *lora-balla ;* these the very young, *katatama.*

NGALA-men : each other, *mbana ;* when children of the father's sister, and he a *gomara—ankalla ;* if a *Mbutjana—tjimia ;* the very old, *katatama,* and these the young by the same name.

Women : each other, *noa.*

GOMARA men : *gamena ;* and he the others, *amba ;* also the father-in-law, *gamena ;* the son-in-law, *kniritjaknatja.*

Women : *maia,* these the other, *katja, amba ;* the son's wife and sisters—*nomara.*

MBUTJANA-men : *rendera ;* these the others, *gamena ;* also the father-in-law and his brothers, *rendera ;* the son-in-law and his brothers, *amba.*

Women : *kwaimba ;* these the other, *gamena.*

BELTARA-men : *kata, kniritja ;* these the other, *katjia, lirra.*

Women : *wunjinga ;* these the other, *katjia, lirra ;* the mother and sister of the wife, *mahra.*

PUNGATA-men : *kata, kniritja ;* these the other, *katjia, lirra.*

Women : *wunjinga ;* these the other, *lirra, katjia.*

Bunanka-women call the

BUNANKA-women : the elder, *kwaia ;* the younger, *itia.*

Men : the elder, *kalja ;* the younger, *itia ;* very old ones, *katatama ;* these them in return, *arenga.*

KNURAIA-women : the elder, *kwaia ;* the younger, *itia.*

Men : the elder, *ebmana ;* these them also, *ebmana* (therefore mutually).

PURULA-women : *kwaitjala,* and these them similarly ; the very old, *lora* (mutually).

Men : *noa,* and these similarly in return ; the children of the father's sister in direct line, *ankalla,* in indirect one, *tjimia* (also when the father of the mother).

NGALA-women : *kwaitjala,* these similarly in return.

Men : *noa ;* these similarly in return.

GOMARA-women : *maia,* these the others, *amba.*

Men : *gamena,* these the others, *amba ;* if the husband's father and brothers, or the brothers of the mother—*mbatjinga* and *kaljimba ;* these them in return, *nomara.*

Mbutjana-women : *maia ;* these them, *amba.*
Men : *gamena :* these them, *amba.*
Beltara-women : *wunjinga ;* these them, *lirra, katjia ;* the mother and sisters of the husband, *kwaianirra ;* these the wife and sister of the son, *lirranirra.*
Men : *kata ;* these them, *lirra* or *katjia ;* the husband and brothers of the daughter, *wuiamahra.*
Pungata-women : *wunjinga ;* these them, *lirra, katjia.*
Men : *kata ;* these them, *lirra, katjia.*

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6. Tribal Marks or Tokens.

The classes possess no class-marks, but the tribes living southerly and westerly from here, called *loritja*, have one in common with ours distinguishing them from those dwelling north and east, who are called *ulpma.* The mark of the latter consists of emu feathers worn on the forehead and upper part of the arm, while that of the former is made of small sticks scraped into little bunches of shavings, which they wear upon the head.

c. Arts.

The arts of this people are not of much account. Still, it is astonishing how they can have produced some of their utensils with their rude tools, such as stone axes and knives. These consist of a kind of sharp flint, which is found south of the Krichauff Range, and which these natives barter for other things. To make an axe they take a piece of wood with a fork at one end, into which they fix the stone with resin. The latter they prepare by crushing it moderately fine between stones, sprinkling some water upon it, holding it over the fire until it melts, and then kneading it well together. The stone-knife is fixed to the handle of their *tmera*, and is more like a chisel than a knife. The *tmera* is a trough-shaped piece of wood hollowed out thinly, and about two feet long, somewhat bent together at both sides, straight and open at both ends. One end has a barb for throwing spears ; the other forms a flat handle with the stone-knife fastened to it. They fix the spear to the barb, grip the handle of the *tmera* and the spear with the same hand, throwing the latter only. The spears (*tjata*) are made of various kinds of wood suitable for the purpose, such as *Tecoma australis*, *Acacia aneura*, &c., and thinner at the hinder than at the anterior extremity, being respectively about the thickness of a thumb and of a little finger. The length varies from six feet to ten feet, according to the intended use. For fishing short ones are used, without barbs, and made out of one piece ; others have an extra piece, six to eight inches long at the point, made of hard wood (*Acacia*

Kempeana) as a headpiece, which is fixed with the sinews of marsupial rats to the shaft. Fastened to this is a small barb, a few inches distant from the end, which terminates flatly instead of cylindrically. If the shaft becomes too short, it is lengthened by another piece firmly fastened on with sinews. They are generally called by the name of the wood employed in their manufacture. For defence they have a shield, *ulkuta*, two to three feet long, and one foot wide, made of the wood of *Erythrina vespertilio*, of trough-like shape, and with a handle on the inner face. Various sized domestic utensils for food and water consist of hollowed wooden basins, made of different kinds of timber, which are used also as substitutes for cradles, &c. Wherever a mother goes she takes her baby with her, carrying it in one of the troughs under her arm and resting it on her hip.

A thick stick, five to seven feet long, serves as support to the old people, and is used by the women to dig out roots, worms, or rats. Frequently this stick is also used for chastising purposes even to the effusion of blood or stunning the culprit. The men have a shorter stick about two feet long, but do not employ it as frequently as the women, because they are obliged to go out hunting, and when quarrels arise they use their spears. From the skins of marsupials bags are made, but rags are beginning to be used instead. If they happen to pick up a piece of iron, they make a handle with rags and sharpen one end upon sandstone. For filling cracks in their basins, and for fixing the stones in their weapons, resin from a certain species of porcupine-grass is used.* They bruise this grass until the resin becomes fluid, and then knead it into a single lump. When they wish to plug up a crack, they soften the mass with heat, and then press it into the fissure. It resembles black sealing-wax, but is not quite as brittle. They call it *nurbma*. Of the hair of various kinds of marsupials they spin cords for ornamental purposes, and amulets, and charms. For the latter purpose they also use the hair of the dead. For spinning they bark a small stick, eight to ten inches long, form a slit, and put a short crosspiece through, so as to form a kind of cross. At the lower end it is pointed. When used it is placed upon the thigh, and with the hair rolled rapidly towards the knee, twisting the hairs together as it revolves. When the yarn has attained a length of two to three feet, it is wound up around the crosspiece. When quite full, the yarn is removed, being wound into two balls. It is converted into thread in the same manner, only that the motion is reversed.

The natives have also some knowledge of the use of drugs. They employ teas made of the leaves and bark of some shrubs

* Probably *Triodia Mitchelli*, or *T. pungens*, both of which have viscid leaf-sheaths [Ed.]

and the whole plant of others, which they drink. Thus they use *Callitris verrucosa*, *Acacia sentis*, *A. strophiolata*, *Stemodia*, *Cynanchum floribundum*, &c.

d. DRESS.

These aborigines are absolutely nude. They practise a certain decorum, which decrees that the two sexes keep 10 to 15 paces apart when they meet, and if necessity compels a closer approach they keep their backs towards one another, or the women step quickly aside. But during quarrels, or in the event of sickness or death, all modesty is thrown aside, and they mix indiscriminately together. In winter they remain between the fires until the sun shines warmly. If they have to go away, they take a fire-stick with them for warmth or to rekindle another if necessary. If they have none they make fire by means of two sticks, which they rub together, holding finely-scraped shavings to the rubbed place. Usually they employ their shield, which is of soft wood, for this purpose, together with the *tmera*, which is of harder wood.

European clothing they like very well. If they can get hold of any old rag they put it on, even if it be only a stocking, boot, hat, or waistcoat, often presenting a ludicrous appearance. Such an article of clothing will circulate among them, one wearing it to-day, another to-morrow. But they have no idea of taking care of clothing, which speedily becomes destroyed.

e. ORNAMENTS.

In ornamenting their bodies the natives devote much time and care, especially the men, which includes anointing it with fat to make it shine. Tattooing is also practised, which they call *urbmalilama;* it is performed on the chest and upper arm, and consists of longitudinal and transverse lines. Usually the son adopts the pattern of his father, but sometimes chooses one according to his own taste. Both sexes tattoo themselves. It is done during childhood, either by themselves or by others for them. Some of the natives have a great number of scars on the chest and arm, produced by scratching the skin lightly with their *irgalla*, or stone knife, or else with a small piece of wood, *ntjala*, or with the shinbone of a kangaroo, about six inches long, and pointed at one end, and then applying powdered charcoal to the wounds, which causes thick rounded scars. Their hair is intertwined with string dyed white with clay, and ornamented with a tuft of white feathers, called *ndualja*. Sometimes they wear three tufts of rats' tails, viz., one in front of the forehead, and one on each side; these they call *albeta*. Through the septum of the nose they bore a hole, quite near the point, through which the *lalkara* is worn. This ornament is made of the wingbone of

a vulture (?) or the Spoonbill Goose, being pointed at one end, blunt at the other, and about six inches long. Besides the above they wear tufts of white feathers attached to the upper arm. The principal adornment, however, consists in the *ulbelalama, i.e.*, the painting of the body with yellow, red, and white clay, ochre, &c., into various patterns. They have, however, certain rules and a certain order for this, to which they adhere. The usual decoration consists—besides the ornaments mentioned above—of a semicircular red or white streak above the nose and on the cheeks, the convexity upwards; red or white dots on the forehead; and several elongated curved red streaks on the chest and abdomen, which gradually lengthen, so that one ring-segment overlaps and encloses the other.

A messenger, however, wears red strings in his hair; four tufts formed of finely-split and scraped sticks some five to seven inches long, fixed upon the head, and called *lilinba:* a thick black dot or broad streak painted on the forehead; and a semi-circular one of red paint over the nose. Besides the concentric oval red streaks on the chest and abdomen mentioned above, two red and black ones of semicircular form, and turned upwards, are placed above the former. On both sides elongated red streaks are made, which look like bundles of sticks. Upon the back the messenger has a sort of red disk, formed of concentric rings, with four half-round disks, also consisting of concentric curves. Other figures are painted for their *tjurunga*, corroborees, of which more will be said hereafter.

f. HABITATIONS.

The natives do not expend much labor upon their dwellings. In half an hour they can erect a shelter. They gather bushes or branches, which they stick into the ground in a circle of five to seven feet in diameter, the largest first, with the tops touching; the gaps are then filled up with smaller branches, and the dwelling is finished, an entrance being left on one side. If rain threatens, grass or anything they can get hold of is heaped upon the "wurley," making it look like a rubbish-heap. Inside the ground is loosened, and the earth pushed against the walls, so that the floor resembles a shallow bowl. The locality for a settlement is usually decided by the elders. They are not at all particular, building in river-beds, on elevations, &c., the principal consideration being the proximity of water, and that the soil be not too hard. Each one erects his hut wherever it suits him. This work is chiefly done by the women. Separate places are assigned for the unmarried men and for the single females respectively, the latter being called *lukara*, and the former *nkanja*. If a married couple cannot agree, one or the other of the couple withdraws to one of them. Sometimes it happens that the hus-

band goes to the *lukara* with a stick, and fetches his wife back again, which rarely passes off without much turmoil. The pregnant women also live in the *lukara*, and build themselves one or more huts, from which the young men usually keep away. By day the young natives sit in the shade (*bunja*) of a tree, and by night sleep in the open-air; if it rains, they see where they can get a lodging. A village is called *tmara*, a single hut *lunga*—*i.e.*, shade, the only purpose it is intended for. Wherever the shadow falls, there they sit or lie, in the morning on the western, in the evening on the eastern side, at mid-day inside, or under a tree, the fire being close by. At night all sleep outside, even during the cold winter, arranging themselves between the fires. It is only during rainy weather that they go inside their huts. When a member of the family dies, the hut is burnt down, and the whole village shifted to some distant place. A council-hut is not built. If the men desire to discuss anything, they sit aside in the shade of a tree, or under the open sky.

g. FOOD.

Although the country is but poor, the natives have a number of articles of food, many of them not of a choice or very digestible nature. They divide these nominally into four classes, viz., (1) *garra*, meat; (2) *ntjaba*, worms and beetles; (3) *mana*, plants, vegetables; (4) *unkuala*, sweets.

1. *Garra.* Their meat consists of marsupials, *tanatana*; birds, *deba*; fishes, *irbunga*; lizards, *loatjira*; snakes, *apma*.

The natives hunt all kinds of marsupials with the greatest zest, from the largest kangaroo down to the smallest mouse-like animal, or dig them out of the ground. The larger the animal the better pleased they are, but they refuse none. The hunting of these is the privilege of the men, accompanied by the bigger boys. They leave in the morning, taking with them their spears, *tmera*, and sticks, usually going in pairs, or several together. They like windy or stormy weather best. On such occasions they hasten away, for the game is confused, and remains crouching, or hiding the head in a bush. The hunters advance against the wind, or sideways to it, in order that they may be neither heard nor scented, and in this way they usually secure abundant booty. They often light extensive fires to confuse the animals, and make it easy for them to spear them. They employ all sorts of decoys. Espying some game at a distance, one of them endeavors to attract its attention by various movements, while the other approaches unseen from behind to spear it. They also go out hunting in bright moonlight. The women are allowed to dig out the animals which burrow.

Lizards or snakes are captured by means of spears, sticks, or

stones, both by the men and the women. All the large or moderately-sized lizards and non-venomous snakes are esteemed as tit-bits. Their success in capturing birds is but slight ; turkeys and pheasants but rarely, and emus only at their drinking places. For this purpose a hiding place of bushes is constructed quite near to the water, whence they spear them. They also put bushes of *Duboisia Hopwoodi* into the water, which intoxicates the birds, making them easy to spear. But other animals become poisoned, only escaping to die subsequently, so it is said. Young birds, especially parrots, when these are almost fledged, fall an easy prey to them. Sometimes they capture whole basins full of young birds. The eggs, especially those of emus, turkeys, and pheasants, are much prized.

Fish of large size are speared by men and boys, and eaten. When the water in the holes shrinks, they construct a barrier of bushes at one end across the water, and which is thus pushed slowly towards the other end, thus driving the fishes forward into shallows, or causing them to become entangled in the branches, when they are easily caught. This work is done by men as well as women. Crayfish are not eaten.

All the above animals are roasted in hot ashes and eaten, even to the entrails, the coarser contents only being shaken out.

2. *Njaba.* In this class of food are included insects, caterpillars, and all kinds of wood-grubs. In summer a kind of insect (Cicada sp.) comes out of the ground wherever *Eucalyptus rostrata* occurs. This the natives call *alknenera.* The males produce an incessant strident noise by means of two chambers, one on each side, united by a transverse channel across the underside. A somewhat smaller kind occurs where *Acacia aneura* grows. Of these insects the natives collect whole basinfuls, roast, and eat them. A peculiar kind of caterpillar (*weba*) appears usually in immense numbers after rain in summer. These they eat also with relish when roasted. Most of the woody plants, especially in the roots, contain grubs, the largest being about as long and as thick as a finger. Whilst all these are considered delicacies, they will not eat locusts.

3. *Mana*, vegetable food. This food the women are obliged to provide. Several kinds of yams (*woritja*) grow here, one attaining to the size of a man's head or more, but all very fibrous. Under the term *angna* the natives include the various larger and smaller fruits of capers, cucumbers, convolvuli, nightshades, mistletoes, and those of some shrubs whose berries resemble bilberries. The taste of the latter is not unpleasant, but the interior is almost all stone, as with the fruits of *Santalum acuminatum.* All the other fruits have a harsh, sharp taste, and consist almost entirely of seeds. They are eaten either raw or

roasted. The natives also collect the ripe seeds of various species of Acacia, first roast, and then grind them with water upon stones to a kind of paste, which they at once eat. Of these seeds they might at times collect large quantities and store them, the bushes bearing most profusely, but it never occurs to them to do this. *Ntanga* are seeds of various grasses and herbs which are collected by them in their trough-like basins, then ground down with water into a paste, and poured into hot ashes and baked. This is their *egalla—i.e.*, bread. Unfortunately, they have it only rarely, and but little at a time. A few kinds of herbs, inclusive of wild cress, they pick and stew green in the following way :—First, they light a large fire on the sand, remove this, and scrape the hot sand aside, so that a shallow depression is formed. Into this they place flat stones, spread the moistened cress upon them, and cover it over with other flat stones. The heated sand is heaped over the lot. After a while this is carefully swept aside, and the cress or other herb is found to be nicely stewed ; it tastes best of all their *mana*. When nothing else is to be had, the roots of various grasses and shrubs are collected, as, for example, those of the common reeds, &c. These are roasted and pounded with stones to soften them somewhat and make them less fibrous. They are swallowed in pieces, for chewing has no effect, as they remain wood-like. A real "bread of misery." The young roots of the reed are the best, but they do not long remain fresh. Sometimes after rain pea-like bulbs are found in large numbers, which have a nice, nut-like taste. These bulbs are partly eaten raw, and partly roasted.

4. *Unkuala*, sweetmeats. These comprise honey, the nectar of flowers, and the exudations of several trees and shrubs (resin, gum), and even one species of ant. There are two kinds of bees here, viz., a dark-colored one, which builds in hollow trees, and a light-colored, greenish species, that nests in the ground. The former sting a little, the latter not at all. The getting of the honey is a privilege of the men. With their stone axes (now they use tomahawks) they cut a hole down to the honey. While eating the honey, a few wings, legs, or even entire bees may be swallowed in their greedy haste. After rains in spring the blossoms of some plants are so full of nectar that it drops out, especially from those of *Grevillea juncifolia*. The natives collect such flowers in their basins, pour water upon them, knead well, and then drink the water, or else they put a handful of flowers in the mouth and suck the nectar, wholly indifferent to the vermin infesting them. The exudations of shrubs and trees from trunk and leaves serve as bonbons for the natives. The ants mentioned are as large as peas, clear as glass, pale-colored, and viscid.*

* Doubtlessly the honey-secreting individuals of *Camponotus inflatus*, *Melophorus Bagoti*, Lubbock, or undescribed species.—[Ed.]

The natives eat anywhere, most frequently, of course, on the shady or sheltered side of their hut. They eat when hungry, and whatever is handy, even in the middle of the night the pounding of the roots being often heard. The principal meal is generally taken toward evening, when returning from the hunt and the *mana*-gathering. The women collect the fuel, carrying their *mana* and little children in troughs under the arms, while the bigger ones trot along beside them. When the food is ready it is eaten, and the duration of the meal is determined by the quantity of food available. The father tears up the meat, or cuts it with his stone knife, and throws a piece to each one—wife, children, &c. When the father has brought home any big game, onlookers in number appear, and also get a piece each. Certain of the women remain at home in turn to take care of the children, and are also supplied. There is often squabbling as to who shall act nurse, because they like best to stay at home. The natives eat of their stock as long as it lasts, and are gluttonous; but the meat must be well cooked, for they will not eat it underdone, and still less raw.

The natives to the south eat human flesh. It is said that they engage in regular human-hunting parties for this purpose. The father and a brother of one of our converts are said to have fallen victims to this practice, whilst the mother had a narrow escape. It is even said that they roast and eat their own infants, if they succeed each other too quickly. Only last year a woman not far from here did it, and when she was reproved for so doing, by means of an interpreter (for they speak a different language), she was surprised at being found fault with, as she considered the roasting and eating of her own child as something quite natural!

h. VISITING.

The natives are fond of visiting. The meeting place is usually the *tmara nkanja* for the men, *i.e.*, the bachelors' camp; whilst the women go to the *tmara lukara*, or women's quarter. They are extremely fond of narratives, or any news. When strangers arrive they become quite animated, receive them in style, and treat them as well as they are able, introducing them to those in the camp. The reception ceremonies have already been described, when treating of courtesy. When these are over they sit down together and begin to converse, the men congregating at one place the women at another. The latter have no household cares to divert their attention. They offer their guests just whatever they have handy; if they have nothing the guests get nothing, and take it as a matter of course, for it is as they would act themselves. The rule is that the *Beltara* treats *Beltara*, *Gomara* the *Gomara*, &c. Strangers usually sleep together at a separat

place. Next day the visitors stay in the camp while the hosts go hunting to obtain provisions for all. The following day the visitors also go out for that purpose, and usually, all together, after having eaten. Presents are always given to the visitors, such as a spear, *ulkuta*, or other thing. Something uncommon is preferred, such as a knife, pipe, tobacco, tomahawk, or even the shirt off their backs. They would rather go naked than allow their visitors to depart without a present, especially when they know that a certain article was much coveted. When taking leave invitations to return the visit are given, which are accepted and carried out, unless a murder in the meantime prevents it. For it occurs occasionally that spies mix with the visitors in order to gain information to allow of the execution of a pre-determined vengeance. The rejoicing is then converted into the most bitter grief, and friendship into deadly enmity.

i. SORCERERS.

According to their views all serious diseases are produced by demons, or by means of sorcery, and may be counteracted by various performances. These consist almost exclusively in sucking. The medicine- or *ngankara*-man applies his mouth to the affected part, sucks it, and then pretends to have extracted charcoal or other matter that had been inserted by sorcerers or demons. After each sucking, the *ngankara* goes a few paces aside, and spits it out with various ceremonies, putting his hand to the mouth and pretending to take out something, and to throw it away. Almost all the old or middle-aged men are such *ngankara*. According to their own account, they become such when they feel pain in the ears by night, pretending, and perhaps believing, that thus they have acquired the power. All the others believe it implicitly, and try to secure their assistance in all diseases. Usually they visit the sick without being specially called, and render their services gratuitously, being satisfied with the honor. If taxed with the deception practised, they look embarrassed, but find it difficult to discontinue the practice. In difficulties men are apt to look for visible and tangible aid; and others to pose as capable of helping.

k. GESTICULATION.

The gestures and pantomimic expressions of the natives are highly developed. They can express a great deal by means of most varied motions of the hand, and thus communicate with another.

l. VOWS OR OATHS.

Our natives have ceremonies by which they consider themselves bound. As an illustration the following anecdote will serve:—A few years ago they approached us anxiously and in great agita-

tion, and shouted "*tnenka bitjirirama*"—*i.e.*, enemies are coming. At first we would not believe it, until we espied a small troup of natives approaching. We now took up our weapons and went to meet them, whilst the others remained behind, though fully armed. Both parties were requested to lay down their arms, which they finally did, and we exhorted them to settle their differences in peace. After a long discussion some of either side sat down, embraced, and then cut small wounds into each other's backs, so that they bled. The four who did this were the intended victims out of revenge, and the avengers or intended murderers. No evil has befallen these four since.

m. MURDERERS.

These are looked up to as heroes, notwithstanding their cowardice and cunning; and death by spearing is counted as honorable, although they are so terribly afraid of it.

5. Family Life.

The family life of the natives is intimately connected with the social eight-class system. A youth cannot select a bride for himself, or a girl her bridegroom. The betrothal is solely and absolutely arranged by the father of the girl. He promises and contracts his daughter, within the limits of the class, to whomsoever he pleases, either to a *gamena* or *rendera*. The betrothal is often made by the father soon after the girl is born from mercenary motives, for it is seemly that the son-in-law prove himself grateful by frequently handing over to his father-in-law and his bride part of his hunting booty, and helping thus to provide for him in his old age. The bridegroom, *noatjinga*, is thus usually several, often many, years older than his bride, *kurkibana*, and cohabits with her sometimes when she is only seven or eight years old, and still a mere child. As soon as she attains puberty, he claims, and takes her away as his wife, without any initial ceremonies. He may, perhaps, present his bride with a *gulatja*, *i.e.*, necklace of rat-tails, her father with a spear, &c., and her mother with something else. The young woman builds a hut, and they live together afterwards as man and wife, no special festivities taking place. At most, the bridegroom may try to capture some game on their way to his camp, which they, if he be successful, consume together. If the young wife does not like her husband—a by-no-means unusual thing—she soon runs away from him; he follows her, and when caught gives her a beating to make her behave better in the future. Now, when the wife runs away, she goes to white people, and the husband does not venture to ill-use her, but has to wait until it pleases her to return of her own will, and then gladly enough receives her. Very often it happens that if the man has another, older, wife, she conceives a

grudge against the younger, and beats her. The husband attempts to maintain an armed neutrality with his stick. This sometimes causes the elder one to leave, which the husband allows, until he wants her, when he goes for her. This is usually when the younger one is far advanced in pregnancy, and is residing mostly at the *lukara*. As long as the husband does not reclaim her, the wife is considered to be a widow. Some married couples agree very well together, live frequently quite alone in solitude, and together provide for their wants. If a man has two or three wives, and one of them is troublesome, he will present her to one of his friends who belongs to the same class.

These natives believe that the souls of the infants dwell in the foliage of the trees, and that they are carried there by the good mountain spirits, *tuanjiraka*, and their wives, *melbata*. The nearest tree to a woman when she feels the first pain of parturition, she calls *ngirra*, as they are under the impression that the *guruna*, or soul, has then entered from it into the child. Such a tree is left untouched, as they believe that whoever should happen to break off even a single branch would become sick. But if the tree should be injured or broken down by winds or floods, that person would get ill whose *ngirra* the tree was.

When the infant is about to be born, the mother usually goes aside into the bushes, away from the hut. Her mother and sisters go to see her there from time to time, but especially the children, who are very inquisitive. The latter are not ordered off, and are often the only human beings present. When the babe is born, the mother cuts off the placental cord by means of two stones, at a length of several inches, rubs a little dirt on to it, and puts the infant in a trough beside herself. Water is never applied, and only the grossest impurities removed with some sand. Usually deliveries are easy ; no fatal cases have ever been reported to us. As soon as the woman feels herself sufficiently recovered, perhaps in an hour or two, she gets up and walks about with the child in the trough under her arm. If twins be born of the same sex the youngest is killed, but if not, the boy is spared. Miscarriages occur very rarely. The mother waits several days before showing the father the child, by which time it has become somewhat dusky in color. Mothers suckle their children often until the third or fourth year, and if she is absent, another suckles it for her.

Of a proper training of the children they have no idea at all. They allow them to grow up wild. If the children are unruly, the mothers try to quiet them with fair words, or may scold them a little, or even slap them gently, but never take any extreme means. If children quarrel, and one mother ventures to strike the child of another ever so slightly, there is sure to arise a

disturbance between the two, followed by blows and the effusion of blood. When a child gets hurt, either by falling from a tree, or into the fire, &c., the women set up a terrible howling at once. The children show no affection for their parents, and sometimes leave them as early as at six years of age to rove about with others. Such a vagabond kind of life they love dearly, and, for this reason, delight much in riding about on horseback with white people. The girls are hard to train to domestic work, and the boys to any occupation binding them to a certain place.

When a child sickens, the mother takes it in her lap, and does not leave the spot, the father sitting near by; from time to time others join the group. If the illness becomes serious they begin to scream, and the women throw themselves over the patient, covering him with the upper part of their bodies, so that he is suffocated. The same is done with other persons when very seriously ill. But for this habit some might recover. An illustrative case came under our observation. The women having crowded over the patient as usual we drove them away, and gave the child some medicine. It got better, and is alive at the present day. Since then the natives have discontinued the practice, and always ask for advice in the illness of their children. When the patient has breathed his last the lamentations and mournings become accentuated. The eldest person in the camp shouts at intervals some five or six, long-drawn, mournful sounds in a deep bass voice, and with widely-open mouth. At the same time the others throw sand and ashes over each other, untie their hair so that it hangs in a dishevelled mass, the women lacerating their heads with their pointed sticks, and the men cutting each other's backs so that the blood flows. And why? They want to propitiate Death, so that he may not take them as well! There the majority crouch near the dead for a short while with the head hung low, while a few depart in haste to dig the grave. All persons present in the camp assemble at the place of mourning, the corpse still lying upon the lap of the mother or the wife or sister, and covered by the bodies of other women. The graves for men are dug by men only, those for women and children partly by men and partly by women, a sandy spot being selected for the purpose, situated at some considerable distance from the camp. The earth is loosened with the stick and thrown out with a trough, until the hole is four to five feet deep, and so wide that a man can work comfortably in it. Then an excavation is made at the bottom on the side toward their *tmara altjira—i.e.*, the place where the mother of the dead person was born—forming a lateral chamber. When the grave is finished the gravediggers step close up to the corpse, putting their long beards between their teeth, holding it firmly, and making the most grotesque

grimaces. Why? To frighten the ghost of the dead *ltana*, that he may not venture to injure them. Quickly the women are pushed aside, four persons seize the corpse and run with it to the grave, followed by the rest at some distance. On the way others relieve the first, proceeding rapidly onward. Arriving at the grave, one of the men jumps in, the bearers bend the limbs of the corpse against the belly, and hand it down to the man. The latter places it in the side chamber on its side, with the face directed towards the *tmara altjira;* the opening of the chamber is then closed with brushwood, and the grave filled up with earth. The body is placed in the side chamber so that no weight may oppress it, and induce the *ltana* to injure the relations, or remove itself quickly to the *tmara altjira*. Over the main hole of the grave a small mound is raised, and within a radius of several paces all bushes, wood, stones, and grass are most carefully removed. Why? That the ghost, *ltana*, may not find his way readily and hurry off to his *tmara altjira*. Everything is done in a furious haste, and when completed they return to their *tmara* and continue the lamentations. Soon after the hut of the departed is burnt down, with all his earthly possessions, that the *ltana* may not return and injure his kin or other persons. Moreover, the camp is shifted at once to another place for fear of the *ltana*. Next morning the nearest relations leave the camp for some weeks to forget their sorrow, or, perhaps, from fear. The next thing done is to smear the body with white earth—the women all over, the men only the face and chest—and to cut off the hair, in order to make themselves unrecognisable to the *ltana;* and is so effective that they are not readily recognisable at first. As long as the near relations are absent, little mourning and lamenting is indulged in, but as soon as they appear the mournful cries are renewed. Some days after, a number of the natives go to the grave very early in the morning to raise their lamentation there, place brushwood and bones upon it, and sprinkle it with water to satisfy *ltana*, and to induce him to consider that his dwelling, and inflict no evil. Finally white earth is placed upon or sprinkled over the grave that they may soon forget the dead one, whose name, indeed, is never mentioned again for fear he might hear it and do some injury. If others arrive from afar, they go first to the mourners and sit down with them, the women behind the men, the men behind the women, and those of the same sex beside or before each other, and show their sympathy with them by crying and lamenting for a while. When information is received that a man has been speared, or a man or a woman killed, &c., weeping, lamenting, and shouting at once begins. Such a dead person is buried by the finder, and the wife or wives are married by the brother next following in age. He does not assume an

additional burden by so doing, for they provide for themselves and their children. When he has something, he divides it with them, and in return receives his share of their *mana*. Orphans fare the worst, and usually the nearest relative looks after them, but does not assume a parent's position. Such children receive blows, and have to provide for themselves as best they can.

The avenging of a murder is the duty of the nearest relatives of the murdered person. But how do they know who committed the deed? This is an open secret, for all know the deplorable customs, and consequently each other's enemies. The murdered person and his relatives were perfectly aware whom he had killed, and the nearest relatives of the latter were his avengers, whom they knew well also, and, therefore, the murderer, *urana*. The practice of sorcery makes a slight difference, which will be explained hereafter. If the relatives of a murdered murderer considered that their father, brother, or son had deserved his violent death, all would be well, but this they do not by any means. They accordingly devise and plan how to inflict the same upon the *urana* of their own relation, or upon his next of kin, the *aruninja*. If it cannot be done at once—the brothers or children being, perhaps, yet too young—it is done in the course of time—being never forgotten. The most suitable opportunity is waited for; the murderer and his next of kin, perhaps, become careless, indifferent, or negligent; one of them lives, perhaps, alone for a time at a lonely place. If the avengers become aware of this, they leave at night, surprise, and kill him, for which purpose they paint the whole body a deep black. These avengers know perfectly well what fate awaits them, and that some day they will become its victims, and, therefore, there is no end to the feud. To this must be added the murders occasioned by their belief in sorcery. If the avengers—for almost always there are several, at least two, because no one ventures to go out alone upon a blood-hunt—succeed in obtaining the assistance of a number of abettors, and feel sufficiently confident of their overwhelming force, they attack their enemies by daylight, and are then called *tnenka*, on account of the open invasion; but *urana* if the deed is done secretly.

6. Government.

The natives around the mission station have a kind of government, being ruled by the aged men and medicine-men. It more often fails than not just where it ought to act, as, for example, in putting down the murders. On the contrary, these deeds are encouraged. This state of affairs arises from the fact that they form no nation, nationality, tribe, or triblets. Properly one can only speak of families among them, and these possess equal

rights as regards each other, only those families which are inter-related being more intimately united amongst themselves. But even among the related ones such murders may occur, as is shown by the following incident. There live here two distantly related families, the head of one of them having a second wife, who comes from the MacDonnell Ranges, who is rarely in this locality. Last year the old and solitary wife of the head of the other family went to the MacDonnell Ranges, as was her custom, and was beaten so severely by the other woman and her relations, that she succumbed to her wounds on her way back. For what reason? The daughter of the aggressor, by another long since deceased husband, had died shortly before. The old people and the sorcerers concluded that she had been killed by the son of this old woman by means of witchcraft. As this son was blind, and always stays here, they could not easily get hold of him, so the mother, or next of kin, had to suffer and die instead. The husband of this murderess is extremely irritated about it, and would like to go and punish his wife by beating her as severely. He has only abstained from doing this because we placed the consequences of such action clearly before him, namely, that he would beat her till she died, and then her relative would avenge her by killing him. It is a sad case where there is no proper government. It is only in a few instances that the authority of the aboriginal government can be perceived. Thus, when a new camp is to be pitched, or a settlement formed, the old people indicate the spot. Also, in the event of dissensions, an order or rule is obeyed preventing these from ending in murder, for under the influence of violent anger the natives have no self-control. Consequently as soon as two men become angry and proceed to high words, the others hasten to interpose themselves fully armed, to conciliate as much as possible, and even to part the disputants forcibly. As a result, the disturbance ends, usually in such cases, in the antagonists only inflicting wounds with knives or spears in the thick flesh of the thighs. Afterwards, the one who commenced using violent means, or, if it has not gone so far, the one who started the quarrel has to leave the place, and is practically exiled for a certain period. Knowing this rule, the guilty person starts voluntarily the following morning, without the least opposition, and when he returns everything is forgiven and forgotten.

There is also a law or rule in respect of widows. A widow must marry the younger brother of the deceased. The latter never objects, for men are always pleased to have as many wives as they can get, but it happens sometimes that the widow is not willing, and does not like the man. However, the *knirabata* and *ngankara*, old men and the sorcerers, try to enforce the rule by argument and persuasion, and, if this be ineffective, by scolds

and threats, the latter referring to their magic powers. These are the principal means whereby the aged and the sorcerers attempt to attain and retain respect and authority, and do gain it. The respect, which is paid them by the women and the younger members, is based on a belief that they do possess magic powers. Notwithstanding all this, it happens that widows do marry their favorites, and follow their own inclination, especially if the legitimate bridegroom does not possess the physical strength to compel compliance, such as being blind, lame, &c. Also, in arranging for feasts, the aged are priviliged, and are the principal organisators of such.

7. Religion.

The well-known festivals or dances of the natives, called by them *tjurunga* and *ildada*, are ordered and arranged by the old people. Each one of these has one or more of these *tjurunga* as his special privilege or monopoly. This right does not pass to his sons as an inheritance. When one of these ancients wishes to celebrate his *tjurunga* he consults with the others, and then messengers are sent by him to the neighbours, inviting them to attend at his *tjurunga*. The invitations are delivered by young men, who ornament themselves in the peculiar manner, explained above, and which renders them at once recognisable as messengers. In the meantime the men at home secretly prepare themselves suitably for the occasion, as no woman or child must see anything of it. The old man whose *tjurunga* it is orders everything to the best of his ability ; he alone is supposed to possess the requisite knowledge or original inspiration. Thus one of them owns the *ilia tjurunga*, or emu festival ; another the *jarimba tjurunga*, or fish festival, &c. These festivals are no mere pleasure-bouts, but serve another purpose, and have a religious significance. Their proper basis, I believe, is worship, or, more correctly, idolatrous service, and a consideration of the whole surroundings points to this conclusion. It must be mentioned here that the natives possess small disks of slate and wood, about as large as the hand, called *tjurunga arknanoa* (festival plates), which are secreted in caves, and which neither woman nor child must see. Upon these various markings are engraved, which the respective old man to whom they belong alone understands, describing the whole meaning of his *tjurunga*, as to its origin and purport. They pretend that these *tjurunga arknanoa* were *altjira*—that is, were not made —but I suspect, as they occasionally give some to white people, that the old men and sorcerers make them themselves. They also present some occasionally to the young men, and initiate them gradually into the whole secret meaning, and finally, I believe, into the whole system of deception. No one, however, ever reveals the fact, although one may read it in their faces. Why

not? They fear death; if discovered, it might cost them their life. If one attempts to deprecate the *tjurunga* of the old, it may happen one day that the traducer is killed for this offence, a case of the kind having occurred in the MacDonnell Ranges only a few years ago. The old one whose *tjurunga* it is explains its import and meaning to the uninitiated, and what is it? All the festivals refer exclusively to eating or to the supply of food, and it is pointed out whence the various objects as emu, fishes, &c., are derived; in what number and size they formerly existed, &c., which forms also the burden of their songs. These festivals serve as reminders, and extol the past, conjoined with prayers that these animals, &c., may again appear in the same numbers, of similar size, &c.

According to the nature of the *tjurunga* is the ornamentation of the body; thus for a fish festival the body is painted with fish-like figures, although the figures may be the same for several. The characteristic behaviour and cries of the respective animals is mimicked by the dancers, of which art they are really masters. Sometimes it happens that one or other does not celebrate his festival in his own district, but goes to another with his people, and holds it there that the other people may become acquainted with it. The preparation occupies them usually for days, sometimes for weeks, the chosen spot being cleared of all rubbish until it looks like a tennis-court. The head-dresses and the painting of the body requires also much time.

When everything is ready, the festival commences towards the evening. Women and children hurry towards the spot, and sit down together in a mass at one end of the arena, the men sitting in front of them. The chief old man and the festive dancers sit apart at a little distance. The singing, conducted by the on-lookers, begins. One or two dancers then step forward and execute a dance, consisting in keeping time to the singing by vigorous stamping with the feet, endeavoring at the same time to imitate the peculiarities of the particular animal that lends its name to the festival. After a while a pause is made, succeeded by the performance of another, and thus it goes on throughout the whole night, and for three or four nights in succession, while they rest and sleep by day. During the day the women have to provide the food for eating, and on this account such festivals are always held at a season when some article of food is to be had in abundance and within the immediate neighbourhood.

The following are a few of the native songs to show their form and contents:—

1. "*Titjatitjana jala ramana!*"
   "Large Emu, many tracks!"

2. "*Magatjagatjana werilankana!*"
"Innumerable Emu have been here!"
3. "*Lambulambila laintjirbmana!*"
"The name of a bird is upon mountain-sized water!"
4. "*Galbmantalanta janian gatitjalanta janian!*"
"Honey much, Yes! yes! Very much; yes! yes!"

Most of the words of these songs are partly obsolete, and partly taken from other dialects. This explains why they are not understood by every one. One knows one song, another a different one, all being connected with the particular *tjurunga*, and derived from their ancestors. Their festivals of circumcision have not been seen by us. What I know of it is only by hearsay, hence I merely mention it. The youths are circumcised at puberty.

Respecting an after-life, the natives say that the souls of all go to *laia*. They cannot explain how this does not accord with the *tmara altjira*, and detailed when speaking about the burial.

By *laia* they understood a lake north from here, on whose shores the souls live, and eat the best of food, which, especially fruit, is found there in great abundance.

8. Superstition and Witchcraft.

The natives are very suspicious of impending evil, and have a great fear of death. Everything unusual or extraordinary in their opinion portends some danger. When an infant is born, its hair, and that of the mother, is cut off, so that both may recover quickly, and grow fat. The natives regard leanness almost as a disgrace, and on this account do all they can to become fat by taking care not to work too much, and lying about and sleeping, or strolling idly. To be able to eat much is accounted honorable, and he who can stow away the largest quantity is respected as a thorough man. Such a one boasts of it, and prides himself at being always hungry, and able to eat. The phrase "*jinga ngaiala nama*"—"I am hungry"—is used frequently, and with emphasis, even when a piece of meat of a pound weight or more has just been consumed. In order to get strong and fat, several cords of the hair of marsupial rats are worn about as thick as a finger, namely, a short, tight-fitting one around the neck, called *gulitja;* a longer one reaching down to the breast, called *matara;* and another, *gulitja*, around the upper arm. These cords serve likewise to fix the tufts of feathers.

The men sometimes cut off the hair of the dead, spin it, and make a kind of net of the thread, which is either worn around the neck, or in the bag under the belt over the hip. Great magic powers are ascribed to this *gururkna*, for he who has got one is always safe, and none can hurt or kill him. The greatest care is

taken of this charm ; if lost, no pains are spared to find it again, and if not recovered, a feeling of insecurity remains. When about to set off on a journey they try earnestly to obtain one, or to borrow one for the occasion. For all that, however, it is astonishing how timid they are. If an unusual noise is heard at night they suspect enemies, even if it is only caused by a harmless animal ; nay, when so alarmed, they often mistake trees, animals, &c., for enemies in the broad daylight. Their pernicious customs make this feeling of fear often only too well founded.

Twins portend evil, because uncommon, hence one of the infants has to die ; it is said that some kill the boys derived from a white father.

If one falls sick or dies, the natives at once conclude he must have been bewitched, or bitten, or hurt by the devil—*eringa*. At the same time they think they can bewitch others, the old ones and the medicine-men especially fostering that belief. For this purpose they employ various magic agencies as charms, as the following :—

1. *Nguanja*, a stout, oblong piece of wood or bone, resembling a lead pencil, which, when of the latter substance, is made of the tibia, or big bone of the emu. At one end it is a little thicker and blunt, while the opposite extremity is thinner, and tapering to a point. This implement is thrown by the old men and sorcerers in the direction of their enemy to make him sick, or to kill him, as they imagine.

2. *Ntjala*, resembling the former in shape, but made of the shinbone of the kangaroo. The old man or sorcerer points with this at the enemy, who sits near his fire, at some distance, in order to sicken or kill him.

3. *Kwalja-kwalja*, a tuft of emu feathers, worn usually fixed under the belt at the back ; it is supposed to protect them from their enemies, and to give the wearer strength to kill them.

4. *Dara*, a tuft of eagle feathers, serving the same purpose as the preceding.

5. *Lalkara*, a little implement about six inches long, and either of wood or bone, which is worn through the septum of the nose, and by means of which they also think they can hurt others.

Finally, in addition, they employ magic songs and spells.

Evil spirits and devils are combated in the same way as we have seen when describing the burial rites.

The following supplementary remarks may be added :—

If a person dies at night, men armed with spears place themselves near by to frighten *ltana* (the spirit), that it may bring no harm to them.

When eclipses of sun or moon take place they fancy that the devil (*erinja*) has placed himself in front of those bodies, and

throw their spears into the air in all directions, accompanied by great contortions of the body, in order to hunt *erinja* away.

The comets they consider are big men prognosticating ruin and death; these they bind by spells to one spot, so that they cannot get away, but must finally die.

When the Magellanic clouds are visible in the sky, they speak with a subdued voice, or not at all, for they are the poison-fangs of a gigantic snake. This is in order that the latter may not perceive them, else they might be seen, bitten, and die.

Even the whirlwinds are caused by the devil as he rushes through the air, and thereby stirs up the dirt, but they use no spells against them.

The innocent morning and evening stars are said to point out to the old men and sorcerers whom they are to bewitch.

Mongabarra are the souls of living people wandering about at night, seeking to withdraw the fat from the body of others, and to devour it. The mind of the natives being full of such thoughts, they frequently dream of them, and some pretend to have even seen such *mongabarra*. One native told us one morning a *mongabarra* had taken the soul of his granddaughter, but he had run after it, and recovered it again!

If it rains too long the old natives shout out their spells, and strike against the rain with their sticks to compel it to stop.

To the *albeta*—a tuft of tails of the marsupial rats which they wear upon the head—the old men ascribe the property of charming the boys so as to induce them to demand to be circumcised and be made men (*atua*). No doubt the magic force lies really in the open contempt shown towards these boys until they have been operated upon.

Geological Notes on the Upper Finke River Basin.

By Chas. Chewings, F.R.G.S.

[Communicated by Prof. R. Tate.]

[Read June 2nd, 1891.]

Plate X.

During the first three months of the present year I travelled in zig-zag fashion through and about the watershed of the Finke River, which takes its rise in the ranges near the centre of Australia; and such observations as I then made I now present to the Society, and in doing so, no one is so conscious as myself how incomplete and imperfect my efforts have been.

Pre-Silurian Rocks.

These are found freely distributed throughout the length and breadth of the MacDonnell Ranges. They extend to near the Western Australian boundary on the west, and to the Queensland boundary on the east. On the south the wall-like range, called the MacDonnell Range South, afterwards to be noticed, limits them in that direction; while to the north their extent is not yet known. Throughout they are highly crystalline in structure, distinctly stratified, with a dip in general to the north at a steep angle. Hornblendic rocks give the north side of the ranges and outlying hills a black appearance—on closer observation they weather into rounded masses, and crack in all directions, often circular. Mounts Hay and Chapple Ranges are composed of this rock. Feldspar (probably oligoclase) exists in the district, and I found garnets as well. Impure garnets form a constituent part of the hornblendic schist, which is closely compacted, massive, and intensely hard.

From the appearance of these rocks, the contour of the country, and the remarks made by the late W. C. Gosse and Mr. Charles Winnecke, F.R.G.S., on the Reynold's Range, situated some 90 miles to the north, and the late Colonel Warburton's remarks on the country to the westward and north-west, I am assured that the country now known as the Burt Plain, and from that to the Reynold's Range, has been denuded, and is now many thousands of feet lower than it originally was. It probably averages not less than 2,000 feet above sea-level. This land, which is now a

level expanse of plain and drifting sandhills, with here and there low bluff hills and salt marshes dotted over it, was at a subsequent period to the Silurian upheaval the highest tract of land in Central Australia.

When the quartzite capping, which will shortly be noticed, became denuded, the pre-Silurian rocks weathered away much faster than the rocks to the south, which are partially in places and wholly in others covered by Silurian quartzites; thus we have high land still where quartzite exists, and lower land where it has been denuded.

The southern edge of the Burt Plain is bounded by an escarpment of crystalline rocks consisting principally of chlorite schists and granite; the escarpment rises abruptly to an average height of 800 to 1,000 feet. These remarks refer to that portion of the range from Mount Zeil to near the Alice Springs. The drainage to the north is short, but the southern drainage starts immediately from the top of the range. This ridge is really the watershed of the MacDonnell Ranges, though higher peaks and ranges exist some few miles farther to the south.

Micaceous schists and metamorphic granite follow on in regular sequence to the south, with occasional outcrops of coarse eruptive granite and other eruptive rocks. Long ridges of hard white quartzite nearly vertically disposed, and dipping comformably with the schistose and stratified granite-rocks run through the country east and west, and form absolutely impassable barriers to the traveller, saving along the creek-channels, which intersect them. These ridges form the highest ranges in the MacDonnell, and mark the lines of faults, which are frequent. Mounts Zeil and Liebig are exceptions, being formed of metamorphic granite. Then follow metamorphosed clays and shales interstratified with yellow and blue crystalline limestone, which conclude the series. In the neighbourhood of these rocks there are marks of great erosion and denudation. Prior to the great Silurian upheaval, hereafter to be mentioned, these rocks were overlain by more than a mile in thickness of Silurian quartzites, limestones and shales; the only remnants of which are the ridges and patches of quartzite and limestone. In the neighbourhood of the granitic dykes the Silurian remnants are much scattered.

Mica is abundant in both eruptive and metamorphic granite, and I feel sure marketable sizes will be found much farther to the west than that discovered at Hartz Range. Quartz reefs are of frequent occurrence throughout the granite and schistose rocks, but I regard the western end of the MacDonnell as a splendid field for the prospector. Topographical surveys and a critical examination of rock specimens can alone determine accurately moot questions on the pre-Silurian rocks of Central Australia, and particularly of the MacDonnell Ranges.

Silurian Rocks.

The "MacDonnell Ranges South" form a barrier to and rise abruptly from the limestone and shales of pre-Silurian age. I failed to detect any unconformability between them. The escarpment is formed by the denudation of the limestones and shales. It is my opinion that when these rocks were in course ef formation, the pre-Silurian rocks were horizontally disposed, otherwise I do not think faults could have occurred and placed such long narrow quartzite ridges in their present positions to the schists had the angle of unconformity been great.

The area over which this formation extends has not been determined in many directions, but sufficient is known to be able to say that it approaches the Musgrave Ranges on the south; on the west it extends well on towards Lake McDonald, on the east to beyond the Hale River, and on the north to and inclusive of the MacDonnell Ranges South. There is every probability that beyond these limits the formation stretches to the south-west, to the north-west, north-east, east, and west, over considerable areas, as I am persuaded from the notes of Gosse and other explorers that it extends to and is largely represented in the Mann, Tomkinson, Petermann, and other Ranges; and much of what has been termed "desert sandstone" must be classed under "Silurian." Similarity of physical structure alone has led to errors.

Two axes produce the Upper Finke basin. The larger and more important runs east and west through the heart of the MacDonnell Ranges. At the time this upheaval transpired the Silurian quartzites were largely represented over the area now occupied by the basin, as proved by fossil and stratagraphical evidence; and were by lateral pressure formed into anticlinal and synclinal folds, which run nearly east and west. With one exception, viz., that of an eruptive outcrop, it forms the bed rock of the basin. The second and lesser runs in a north-westerly and south-easterly direction, and junctions with the first near the western end of the MacDonnells, forming an oblique plication of the Silurian foldings, and also the "basin." The latter determines the western watershed, and the former the northern, of the Finke River and its tributaries. To the north and west of these axes small creeks in comparison with the Finke and its tributaries take their rise, run out into sandhill country, and soon are lost. The Finke may be said to follow the lowest part of the basin, and, like its tributaries, maintains a south-easterly course, occasionally breaking through from one synclinal fold to the next farther south.

To return to the anticlinal and synclinal folds within the basin. How wonderfully even the pressure has been can scarcely be

imagined; it must be seen to be fully understood. Not only has the pressure produced foldings of great regularity, but now that many of the anticlines are partially denuded it would be difficult to conceive of strata more evenly and beautifully formed. It is the rule, in fact, where the strata stand at all vertical to find high parallel wall-like ranges reaching for miles, sometimes for scores of miles, through, across, or over which the traveller cannot go. It is possible to ride the whole length of the ranges between walls of rock that tower up perpendicularly on either side, and meditate on the time when the narrow plain through which he rides was once filled with limestones, shales, or other rock equally fragile in comparison with quartzite. This description applies wherever the strata are sufficiently vertical, and no newer formation overlies and fills the denuded space.

The folding is traceable to the south and east until covered by Cretaceous and Tertiary formations. The first synclinal forms the valley now called the Missionaries' Plain; it runs from Gardiner's Range to the Hale River. Looking from this plain to the northward the MacDonnell Ranges South rises almost vertically a thousand feet out of the plain; it has a few foothills, which will be noted hereafter, and designated "Pudding-stone Hills." They attain to, if not over, 3,000 feet above sea-level, and all the ranges of crystalline rocks lying behind and to the north of it are hidden from view. Only a few peaks and tops of the highest ridges as they rise a thousand feet higher can be seen. It is thought that many of the highest peaks of the MacDonnell exceed 4,000 feet above the sea, but if I am not mistaken Mount Giles will be found to be the highest elevation. There are four passes through the MacDonnell Ranges South in a distance of 150 miles, viz., Temple Bar, Ellery's Creek, Finke Gorge, and Mareena Bluff, the latter being near the western end. At the three first-mentioned the strata stand nearly vertical, but in the latter inclined to the south, and some 20 miles has to be travelled before the five miles of range in a direct line north and south can be crossed. Travelling northwards through the pass a wide valley is entered. On the western side a horse could walk up the incline to the top of the nearest cliff; to the east towers up a bold headland a thousand feet high at least. The view from near the entrance to the pass is graphically described by Mr. Ernest Giles, F.R.G.S.* The track leads under receding bluffs on the right; the valley gradually closes through the strata becoming more vertical, and eventually a way is found to the north through a creek-gorge by which the pre-Silurian limestones are reached. Apart from the grandeur of the pass, the strata at this place are

* "Geographic Travels in Central Australia," 1875, p. 22.

so inclined that they can be examined to great advantage, thanks to the quartzite cappings.

It was underneath these bluff-shaped headlands of quartzite that I noticed fragments of fossils amongst the talus, and on climbing-up under one of the bluffs, I discovered some hundreds of feet thick of fossiliferous limestone in thin beds, with intercalated dark-green shales. The limestone was almost wholly composed of fossil shells. I believe they may be had underneath any of the bluffs, and for a distance of 15 or 20 miles without a break. I also found fossils of the same age at the head of both the Walker and Petermann Creeks, which have their commencement on the top of anticlinal folds. The quartzite has been denuded sufficiently to expose the shales and limestones, which have eroded faster than the quartzite sides, and thus a valley has been formed.

A few miles to the west of Mareena Bluff Pass a fault appears on the south side of this range, and exposes a headland of quartzite 1,000 feet thick, horizontally bedded. Wherever this formation is met with the cleavage is most perfect, and where the sandstone remains unaltered, flag-stones of any size may be had.

It would appear that symmetry is the order throughout Central Australian, if not Australian rocks generally. Generalising may be more safely dealt in than in most parts of the world. How regular are the Cretaceous clays and Tertiary rocks overlying them. The Ooraminna (Devonian ?) Sandstone is recognisable at a moment when once its characteristics are known. The anticlinal and synclinal foldings of the Silurian formation maintain such good parallels, that when several sections across them are taken, even a few insignificant outcrops appearing above the recent wind-drift sand, connect without fail the lines of folding. The chief upheaval in Central Australia occurred towards, if not at, the close of the Silurian epoch. It was then that the MacDonnell Ranges assumed their general present shape, and the Upper Finke Basin took on much of its present form. In the synclinal fold, in which Tempe Downs Station stands, was next deposited a rock at least 2,000 feet thick, described as

Devonian—(1) Mudstone and (2) Ooraminna Sandstone,

on the top of which, and conforming to it, was laid at least 2,000 feet of sandstone—the middle stratum may be described as a highly ferruginous fine-grained sandstone, and the present uppermost formation a red friable coarse-grained sandstone; sometimes white and feldspathose. It does not conform to the Silurian rocks, and has been only subjected to slight longitudinal pressure in comparison with the Silurian. It has, however, taken

on in some measure the anticlinals and synclinals of the older rocks. As the horizon cannot be determined until fossils are found we must wait their discovery.

The characteristics of the Ooraminna Sandstone are bold headlands, precipitous sides for 800 feet, cleavage indistinct. It is usually found in localities protected within the synclinal folds of the Silurian quartzites. This extensive formation at one time covered up the James, Gardiners, Geo. Gills, Lewis, and other Ranges, and much of the MacDonnells, not to speak of localities farther afield. The Finke runs over many miles of it, and in the precipitous walls which rise 800 feet on either side the river-bed I saw, when not distant from MacDonnell Ranges, pebbles freely embedded in the sandstone. Flanking the South MacDonnell in the form of foot-hills, but unconformable to the Silurian rocks, are long ridges of pudding-stone extending some 70 miles east and west, and in strike parallel with the Silurian rocks. I noticed at the Gilbert Spring, situated west of the Lutheran Mission Station, pudding-stone similar to that just referred to, and think it highly probable that when the Devonian (?) sandstone was being deposited the MacDonnell Ranges were higher from their base than they are to-day, though probably islands in the sea; the waves dashing against the rocks broke off fragments and distributed them over that part of the basin nearest the MacDonnell Ranges, and thus were formed the pudding-stone hills. I consider it probable the red sandstone and the pudding-stone, which are conformable, are one and the same formation. The part that is left can only be called a remnant of what once existed. In many places near the MacDonnells so much mica is in this rock as a constituent that it glistens in the sunlight. Prior to the deposition of this formation the MacDonnells had been denuded in places of all Silurian formations, for I saw a hill of *pre*-Silurian schists capped by mudstone. The capping of mudstone was dark-red in color, and on climbing to the top of the hill I found the strata were twisted and compressed into almost every conceivable shape.

This brings us to the second series of foldings that Central Australia has undergone. I do not think in this instance there was any great upheaval; nor, for the matter of that, do I think there was in the Silurian upheaval; in both instances lateral pressure from the north disturbed the strata, and in this Devonian (?) disturbance the Silurian and pre-Silurian strata were horizontally compressed into sharper folds, the extent of which is indicated by the gentle anticlinals and synclinals of this formation. Between the Silurian and the Devonian, if we may judge by the appearance of the rocks, there was a wide break, and I saw no intervening strata; on the contrary, the mudstone

and sandstone abutt right on to the Silurians. Subsequent to the Devonian (?) epoch, it is evident that the MacDonnells were meanwhile degraded to their present level, or nearly so, for out of the valleys in the heart of the MacDonnell rise flat-topped hills, chiefly of coarse sandstone rock frequently porcelainised. Mr. H. Y. L. Brown has expressed the opinion that they may be of

Mesozoic (?)

age. The strata dip south, as a rule, but sometimes to the north. In the valley in the MacDonnell on which Glen Helen Station stands a few miles of this formation is exposed, but it is being fast eroded. It is probable the horizon will prove to be early Mesozoic. Again, on the sides of the Silurian anticlinals in the James Range remnants of a deposit, containing a large percentage of manganese and iron, resemble these hills in the MacDonnell, as also do several hills in the valley of the Finke, where it debouches from the ranges on to the Great Southern Plain and in other places. A striking resemblance in the dip is noticeable wherever these hills are met with, and they are seen to dip beneath the clays of the Lake Eyre basin.

I have now to record the third series of foldings, and it was lesser than either the Silurian or Devonian (?), and may be termed the "Mesozoic" upheaval.

Cretaceous.

How much folding has gone on since the Cretaceous clays of the Lake Eyre basin were laid on is a matter for conjecture, but from exposures I saw near the junction of the Finke and Hugh Rivers, I judge it has undergone slight folding. I saw no trace of this formation within the range-country—it has been pierced where only a few feet thick at the junction of the Palmer and Walker Creeks, and also to the south of that in wells. A limestone-rubble closely compacted with flints and gypsum is the characteristic of this rock on its northern edge, where it rests unconformably on the supposed earlier Mesozoic rocks.

Resting, I take it, unconformably on these rocks, without any very marked change in appearance, and horizontally stratified, next follows the supra-Cretaceous or

Tertiary

formations, so noted, so weary to travel over. For a description of which I must refer those interested to a paper read before this Society on April 2nd, 1889, by Mr. J. J. East, F.G.S. His travels led him over the eastern part of the MacDonnells, mine the western. For the most part he travelled outside of the Finke valley. In that paper mention is made of some white gritty hills

with porcelain cappings situated within the MacDonnells near the Elder River. I saw numerous hills of a like character throughout the ranges in my travels. At the extreme head of the Petermann Creek resting on fossiliferous Silurian limestone, and on the Walker Creek resting on mudstone, it may be seen. As a rule the hills are cone-shaped, very white, composed of clay-grit, and always horizontally disposed. There is a difference of 2,000 feet in altitude between the counterpart of these hills in the neighbourhood of Lake Eyre. The interesting problem is, were these hills formed by wind-drift? or were they formed beneath the sea? If from wind-drift, their great elevation is easily accounted for; if on the contrary a marine deposit, it is quite evident Australia was beneath the sea at no very distant geological data. Following on this version, what has become of this immense deposit? and to where has it gone? and by what way? It is so friable that as the waves of the sea gently receded it would be lapped away, and by ocean currents carried to the bottom of some other ocean. But why was Lake Eyre and its basin not filled? or more correctly, why is it a depression? Should not this formation fill it to overflowing? To this may be added that it is evident pre-Silurian and Silurian rocks form the bedding to Lake Amadeus not many feet beneath the blue clay, and farther to the east granite outcrops occur near the western watershed of the Finke. It is possible an ocean current swept through and along this valley, and coming in contact with the Flinders Range rocks carried off all sediment collected on the way, and much of what was already in Lake Eyre basin, which great vortex was probably formed at the close of the Silurian epoch. What treasures of wealth that basin holds can only be told by the diamond drill, but from the fact that coal has been struck at Leigh's Creek, and that the rocks surrounding it on the north and north-west dip into it, it is possible that coal may be found in many places around its edge. To come to a

Conclusion.

The fact is everywhere apparent that rapid degradation is going on throughout Central Australia, especially where the hard rocks are more exposed on the high-lands. The extremes of heat by day, and almost invariably cold nights, cause much contraction and expansion, and the rocks break up. When sufficiently broken the wind, which throughout the summer months blows from the east, carries the sand along and forms sandhills as even as ocean waves. The wind is here a great factor in the transport of eroded rocks, much greater than flood-waters. So porous is the soil that moisture sinks beneath the surface at once in the sandy country, and flows to lower levels. In a few instances an anti-

clinal brings it to the surface again, but instances are not frequent. A note on the fossils discovered by me has been supplied by Professor Tate, appended herewith, and to whom I am also indebted for a determination of the rock specimens.

Note on the Fossils by Professor Tate.

1. From the Head of Walker Creek and Mareena Bluff :—

   Orthoceras sp., related to *O. excentricum* ; a cast.
   Raphistoma ? sp.; casts of three examples.
   Strophomena sp.; allied to *S. funiculata*, McCoy, but the primary ribs bifurcate.
   Phacops sp.; a tail-piece about $1\frac{1}{4}$ x $1\frac{1}{2}$ inches, composed of at least six segments.

2. From Petermann Creek :—

   Orthoceras sp., allied to *O. imbricatum*, the siphuncle very excentric.
   Orthis flabellum.

There is no community of species between the two localities, though at both the facies is decidedly Silurian. The generic determinations of the Mollusca, though probably correct, are based on external resemblances, and therefore subject to revision ; the reference of the Trilobite-tail to *Phacops* is perhaps less reliable. This uncertainty of the exact generic location makes any specific determination somewhat untrustworthy ; and until a larger number of species have been collected it will be desirable to refrain from an attempt to correlate the formation with any greater degree of definiteness, though the balance of the meagre evidence is in favour of Upper Silurian.

Note on a Volcanic Ash from the Island of Tanna, New Hebrides.

By Prof. Rennie, M.A., D.Sc., and Mr. E. F. Turner.

[Read August 4, 1891.]

The volcanic ash of which we give an analysis below was forwarded to one of us by the Rev. W. Gray, missionary to the Presbyterian Church of South Australia, in the island of Tanna. The ash was collected at a distance of several miles from the volcano. The following is an extract from Mr. Gray's letter on the subject:—"The cone on the island of Tanna is about 600 feet high. The crater basin, oval in shape, is about a mile in circumference. It is about 200 feet deep, and contains several vents, from which eruptions take place every three minutes or so. The dust is thus thrown out, and carried for more than 20 miles. The heavier stuff falls nearer the cone, the lighter farther away. But the output of dust varies much in this respect. Sometimes there is very little rough stuff in it; sometimes it contains a large proportion of clear white particles. The dust, when accompanied by rain, destroys some kinds of vegetation. It makes water hard, and curdles milk." Mr. Gray also states that the fine "hairs" which it often contains are called Pele's Hair, Pele being the goddess who presides over a volcano in the Hawaiian Islands.

With regard to the destruction of vegetation, the making water hard, and curdling milk, there can be little doubt that these effects are due, not to the ash, but to acid vapours emitted by the volcano during eruption, and carried down with the rain, especially as quantities of sulphur are known to exist in conjunction with the volcano.

The following figures are the mean of those obtained in two closely-agreeing analyses:—

Silica (SiO_2)	57·30
Alumina (Al_2O_3)	17·96
Ferrous oxide (FeO)	5·04
Ferric oxide (Fe_2O_3)	1·56
Manganese oxide (MnO) ...	·36
Lime (CaO)	8·22
Magnesia (MgO)	3·60
Potash (K_2O)	2·60
Soda (Na_2O)	2·80
Phosphorus pentoxide (P_2O_5) ...	·47
	99·91

Descriptions of New Species of Australian Mollusca, Recent and Fossil.

By Professor Ralph Tate, F.L.S., F.G.S.

[Read September 8, 1891.]

Plate XI.

Genus Siphonalia.

It is generally admitted that *Siphonalia dilatata*, Quoy and Gaimard, and *S. Tasmaniensis*, Adams and Angas, are two sufficiently distinct species; with respect to a third species, *S. maxima*, Tryon, in Manual Conch., 1881, p. 135, t. 54, fig. 355, some doubt has been expressed as to its validity, and after lengthened study of considerable material, having traced-up specimens of *S. Tasmaniensis* from three-fourths of an inch in length to those of seven inches, I have no hesitation in regarding *S. maxima* as the senile stage of *S. Tasmaniensis*.

The species inhabiting South Australian waters are:—

Siphonalia dilatata; *Fusus dilatatus*, Quoy and Gaimard, Voy. Astrolabe, t. 34, figs. 15-16.

This is recorded from Encounter Bay by Angas, 1865, where it is rare.

Siphonalia Tasmaniensis, Adams and Angas *(Fusus)*, Proc. Zool. Soc., 1863, p. 421, t. 37, fig. 1.

S. maxima, Tryon, op. cit.

This has a much longer spire than the preceding, narrower body-whorl, less sharply angulated, with more numerous and obtuse tubercles on the keel.

The species was first recorded by Angas from Hardwicke Bay, where it is a common shell; it also lives among stones at extreme low tides in Encounter Bay.

Siphonalia pyrulata, Reeve *(Fusus)*, Icon. Conch., t. 13, figs. 50*a*-50*b*

The type is from Tasmania, but it also occurs in Port Phillip Bay, and, according to Angas, in Spencer-Gulf.

Siphonalia sulcata, *Lamarck*, sp.

Fusus sulcatus, Lamarck, An. s. Vert., vol. 7, p. 125, 1822.

Siphonalia (Austrofusus) sulcata, Tryon, Man. Conch., 1881, p. 138, t. 56, fig. 380.

Fusus ustulatus, Reeve, Icon. Conch., t. 17, fig. 66; *id.*, Tryon, *loc. cit.*, p. 66, t. 39, fig. 170.

Judging by the figures representing the Lamarckian species, I am constrained to regard *F. ustulatus*, Reeve, a synonym of it. No locality was known to either Lamarck or Reeve; but Angas recorded *F. ustulatus* from St. Vincent-Gulf, where it has occurred to other collectors in later years. Tryon quotes *S. sulcata* as from South Australia. I have seen Victorian examples of the species.

Siphonalia oligostira, *spec. nov.* Plate xi., fig. 6.

This species resembles *S. Mandarina*, Duclos, of the New Zealand fauna, but the revolving threads on the body-whorl, in particular, are flat and without interstitial threadlets; the whorls are not so regularly convex, being slightly angulated postmedially; the spire is proportionately much broader, and the nucleus consists of one and a half very small turns, whereas in *S. Mandarinus* it is cylindrical, of four whorls.

The species makes a passage between *S. Tasmaniensis* and *S. Mandarinus* in its faint shoulder and obsolete nodosities thereon.

Dimensions.—Length, 88·5; width, 42; length of aperture, 56 mm.

Living on rocks at extreme low tides, Guichen Bay *(S. Aust. Mus.)*; Encounter Bay *(Dr. Verco)*.

Genus Latirofusus, *Cossmann.*

This genus was established by its author in "Annales de la Soc. Roy. Malacologique de Belgique," 1889, p. 175, to include certain shells having the outline of *Fusus*, the plicated columella of *Latirus*, and a globulose embryo. He referred to it the living *Fusus lancea*, Chemnitz, which probably includes *F. acus*, Adams and Reeve, and two species of *Fusus* described by Deshayes from the Eocene of the Paris basin. I venture to describe a second recent species.

Latirofusus nigrofuscus, *spec. nov.* Plate xi., fig. 3.

Shell lanceolate-fusiform, three and a half times as long as wide, aperture one-half of the total length; colour brown under a black epidermis.

Whorls seven and a half; nucleus of one and a half whorls, smooth, hemispheric, and large.

Spire-whorls separated by a linear suture, almost flat, spirally lirate; commencing liræ two, increasing to seven, eight or nine on the penultimate whorl, four of which are usually stouter than the interposed ones. The transverse ornament consists of obscure rounded plications (or they may be wholly obsolete), and of

minute threadlets separated by slightly wider intervals than their width.

Last whorl with a rounded periphery, ornamented with slender transverse threadlets and stout spiral threads, the latter alternately large and small, about 15 in number, or the intermediate ones nearly equal in size to the primaries. The base is rather abruptly contracted into a moderately long, but stout, canal, ornamented with about eight distant spiral liræ, and transverse threadlets. Aperture narrow-elliptic; outer lip lirate within. Columella with two oblique plaits, the anterior one at the origin of the canal; canal nearly closed by a horizontal plate-like extension of the border.

Length from 21 to 22; breadth from 6 to 6·5 mm.

Dredged in life one and a half miles off Edithburgh, St. Vincent-Gulf, in three to four fathoms, by Mr. E. H. Matthews; also in shell-sand, Aldinga Bay (*Kimber*); Hardwicke and Encounter Bays (*Adcock*).

Diala magna, *spec. nov.* Plate xi., fig. 9.

Whorls nine; apical whorls two and a half, convex, rapidly diminishing, purplish-black; spire-whorls flat, excavated at the suture, slightly incrassated at the anterior suture, smooth, shining, whitish interrupted by axial flames of reddish-purple.

Penultimate whorl with one to three spiral grooves bordering the anterior suture; the colour-stripes on the grooved surface being broken-up into dots.

Body-whorl with a rounded base; the anterior two-thirds with about nine encircling flat ridges, not so wide as the intervening flat furrows, spotted with purplish-red in the sulci; on the posterior one-third the sulci are obsolete and the colour-spots are confluent but in an alignment with the anterior dots; the whole forming axial bands sigmoidally curved, extending from the suture to the extreme front. Growth-lines fine and regular, conspicuous on the base. Aperture subrotund, outer lip thin, peristome incomplete or thinly continuous, columella simple.

Length, 13·0; breadth, 4·5 mm.

Habitat.—Deep water, Port Phillip Bay, Victoria (*J. M. Wilson*).

This species is at once distinguished by its size, its furrowed suture, and the flat distant ribs on the base. Its nearest ally is *D. lauta*, A. Adams, certain individuals of which have a slightly channelled suture, but the basal sulci are linear, and the colour-spots never confluent. Its rounded base separates it from *D. suturalis*, the only other species with distinctly-furrowed suture; whilst the arrangement of the colour is not seen in any other species.

This genus, founded by Messrs. Adams in 1863, differs from *Bankivia* by its umbilicus. Two living species, both Australian, were described by H. and A. Adams, which remain till now the only representatives of the genus. I have to add one recent species and two from the Older Tertiary of Victoria.

A synopsis of the specific characters is as follows :—

Shell smooth ; earlier spire-whorls subquadrate. *L. picturata.*
Shell with spiral ribs.
Ribs on penultimate whorl, three. *L. cingulata.*
Ribs four, truncated, equal, equidistant ; suture excavated. *L. quadricingulata.*
Ribs three, equal, wavy, with a small one at each suture. *L. Sayceana.*
Ribs eight to ten. *L. octona.*

Leiopyrga picturata, *H. and A. Adams.*

L. picturata, H. and A. Adams, Ann. Mag. Nat. Hist., 1863, p. 19 ; id., Angas, Proc. Zool. Soc., 1865, p. 181 ; 1867, p. 216.

Bankivia (Leiopyrga) picturata, E. A. Smith, Zool. Alert, p. 75.

Trochus (Leiopyrga) picturata, Watson Challenger Gastr., p. 65.

Cantharidus (Leiopyrga) picturata, Tyron, Man. Conch., vol., xi., p. 140, t. 45, figs. 46-48 (1887).

Adams' type is from Port Jackson, where the species is well-known ; Angas reported it from St. Vincent-Gulf, but it has not since been collected in South Australian waters.

Leiopyrga cingulata, *A. Adams.*

Ref.—Proc. Zool. Soc., 1863, p. 507. *Cantharidus (Leiopyrga) cingulata*, Tryon, *op. cit.*, p. 141. Port Essington.

Leiopyrga octona, *spec. nov.* Plate xi., fig. 5.

Shell turrited, narrowly perforate, thin, shining, white, with oblique or axial zigzag pinkish lines.

Whorls eight and a half, moderately convex, separated by a linear suture ; the apical whorls two and a half, turbinately depressed, rufous, smooth. The first two spire-whorls smooth, the third showing faint spiral lines, which increase in strength with the revolution of the spire ; the anterior whorls with about eight to ten equal and equidistant, rounded, and rather depressed cinguli, which are a little wider than the furrows.

Body-whorl equally and regularly cingulated, base convex ; aperture oval ; outer lip thin, crenated on the margin ; columella

thin, but slightly thickened above, and abruptly attenuate to the front, not perceptibly reflexed; umbilical groove smooth.

Length, 10; breadth, 4·5 mm.

Habitat.—Royston Head, South Yorke-Peninsula (one ex.); King George Sound (one ex.).

This species resembles *L. picturata* in outline, but differs by its conspicuous cinguli, its convex whorls, and linear suture; from *L. cingulata* it would seem to differ in shape and in its numerous encircling ribs.

Leiopyrga quadricingulata, *spec. nov.*

Shell turrited, narrowly perforate, thin, internal shell-layer conspicuously perlaceous.

Whorls eight and a half, flatly convex; apical whorls two and a half, smooth, depressed-turbinate; the next two are quadrate, margined at the suture; the following, with an excavated suture, four-ribbed. The ribs are equal, equidistant, compressed, moderately elevated (sometimes having an undulose outline), separated by much wider flat furrows.

Last whorl usually with intermediate smaller ribs between the primaries; periphery rounded.

Traces of colour are visible on some specimens, consisting of a diffused purplish tinge on a white ground.

Length, 11; breadth, 6 mm.

Habitat.—One of the characteristic fossils of the Miocene-Tertiary at Muddy Creek; also at Kalimna, Gippsland Lakes, Victoria.

Leiopyrga Sayceana, *spec. nov.*

Like *L. quadricingulata*, but the penultimate whorl has three primary, compressed, acute cinguli, equal and equidistant, and a slender thread at each suture. The cinguli have an undulate outline by reason of inconspicuous arched folds which traverse the width of the whorls. All the spire-whorls are cingulate; the suture is more or less concealed by the approximation of the sutural threads.

Length, 11; breadth, 5·5 mm.

Habitat.—In the Eocene-sandstone on the beach at Beaumaris, near Cheltenham, Port Philip Bay, Victoria; not uncommon, according to Mr. Sayce, to whom I am indebted for several examples.

Semele monilis, *spec. nov.* Plate xi., fig 7-7a.

Shell ovate-oblong, somewhat compressed, thin, inequilateral, subinequivalve (the right valve slightly flatter than the left). Anterior side the longer, rounded; the posterior side shorter, obliquely truncate in the ventral-half. Ventral margin arched

medially, gradually curving upwards to the rounded anterior extremity, abruptly sloping upwards and outwards to join the post-dorsal slope.

Umbos depressed, acute, approximate : lunule very small, but deeply impressed, broadly lanceolate. The ornamentation consists of rather distant, moderately elevated, rounded, concentric liræ ; and of thick radial threads, separated by nearly as wide flat furrows. The radial threads pass uninterruptedly across the liræ, where by reason of minute crenulations on the lateral faces of the threads, the appearance of punctated furrows is produced. There are six liræ within a breadth of 5 to 10 mm. from the umbo ; the crenulations on the liræ are about 35 in a length of 5 mm. at a distance of 10 mm. from the umbo.

The external colour is a pale-yellow to dirty-white, tinged here and there with rosy blotches having a disposition in the medial and posterior areas to run into flames. The interior is pellucid, changing to opaque-white towards the margin, variegated with blotches and short streaks of a reddish-colour.

Dimensions.—Antero-posterior diameter, 21; anterior radius, 11 ; posterior radius, 10 ; ventro-dorsal diameter, 17 ; thickness at a point a little dorsally to the middle line, 7 mm. A large specimen measures 27·5 by 23 mm.

Habitat.—Cast-up valves at Aldinga (Mr. Kimber); at Moonta Bay (Mr. McDougall). Fresh shells dredged from 17 to 18 fathoms in Yankalilla Bay by Dr. Verco.

Tellina Vincentiana, *spec. nov.* Plate xi., fig. 10.

Shell small, thin, dirty-white, slightly inequivalve (the right valve more convex), considerably inequilateral, the anterior side longer, irregularly ovate, narrowed and pointed behind. Ornamented with close, short, erect lamellæ, becoming fewer and more elevated on the post-dorsal slope, distantly radiate-striated in the interstices ; the lamellæ increase in number by bifurcation at about the middle of the valve, again to unite in pairs close to the front margin.

The front-dorsal margin is a very little convex, and only slightly oblique, the post-dorsal margin being almost rectilinear and very slanting ; the ventral outline is broadly arcuate, more rapidly up-curving in front than behind, posteriorly it has a slight incurvation.

The umbones are small, acute, and a little elevated.

There are two cardinal teeth in each valve, one of which is bifid, and two well-developed lateral teeth in the right valve; the pallial sinus is wide, fused to the pallial line, and extends across the valve to near the adductor scar.

Dimensions.—Antero-posterior, 15·5; umbo-ventral, 12; sectional diameters, 5·25 mm.

Locality.—St. Vincent-Gulf, in 17 to 18 fathoms (*Dr. Verco*).

This species is related to *T. languida*, E. A. Smith, but it has a lamelliform and not striated ornament. Mr. Brazier reports to me that "the species is quite new; it is smaller, and allied to *T. margaritina*, Lamarck, from King George Sound; it is a great deal smaller, and in miniature like *T. ostracea*, Lamarck, from India." The dentition of *T. Vincentiana* will not justify its inclusion in the subgenus *Fabulina*, to which Von Bertin refers *T. australis*, Desh., and *T. margaritina*, Lamarck.

Lucinopsis pellucida, *spec. nov.* Plate xi., fig. 2.

The shell, the diagnostic characters of which here follows, has an external resemblance to *Kellia rotunda* and *Diplodonta globularis*, more especially to the latter by reason of the external ligament. But the internal characters are proper to *Lucinopsis*, as determined by actual comparison with its type-species, *L. undata*.

The left valve has three cardinal teeth; the central tooth is vertical, triangular, and its summit medially excavated, appearing as if bifid; the anterior tooth is lamellar, short, and moderately divergent; the posterior tooth is longer, lamellar, and widely divergent; the anterior cardinal margin has a deep and wide groove.

The right valve has two divergent lamellar teeth, and the cardinal margin in front is furrowed.

The pallial sinus is large, rounded, and ascending, reaching to the middle line of the valve.

Shell rather globose, somewhat circular, and nearly equilateral; it is whitish, slightly glossy, and translucent, ornamented with fine concentric lines and folds of growth, and with delicate radial striæ on the posterior area.

Dimensions.—Antero-posterior, 12·5; umbo-ventral, 12; sectional diameters. 7·5.

Dredged in life (two examples) from 12 fathoms in Yankalilla Bay, St. Vincent-Gulf (*Dr. Verco*).

Crassatella carnea, *spec. nov.* Plate xi., figs. 1, 1a.

Shell suborbicular, rather compressed, almost equilateral; the dorsal margin about equally sloping on both sides, a little arched in front, but rather straighter behind; anterior side rounded, post-ventral margin slightly obliquely truncated (more conspicuously so in young examples); ventral margin moderately curved.

Surface concentrically ribbed, the ribs attenuate laterally, and may or may not be developed to the ventral margin.

The colour is a pale yellow-brown with darker coloured blotches in the median area and before and behind the umbos; sometimes

there are two interrupted brownish-coloured rays bounding the median area.

The interior is rose-tinted and the inner edge of the valves along the ventral margin is minutely crenulated.

Dimensions.—Antero-posterior diameter, 22 ; anterior radius, 10·5 ; posterior radius, 11·5 ; dorso-ventral diameter, 19.

Habitat.—Dredged in life from nine to fifteen fathoms in Yankalilla Bay, and off Rapid Head by Dr. Verco.

This species is very like *C. aurora* and *C. Banksii*, Adams and Angas, inhabiting Bass-Straits, with regard to colour, ornament and crenated margin of valves. It is, however, of a different form, is as widely removed from *C. aurora* as that species is from *C. Banksii* ; thus *C. Banksii* is oblong-ovate, *C. aurora*, transversely ovate, and *C. carnea* is more rotund ; they may eventually prove to be variations in shape of an aggregate species.

The proportion of length to the height in *C. carnea* is 14 to 12, and in *C. aurora* it is 15 to 11.

Pectunculus sordidus, *spec. nov.* Plate xi., fig. 8.

Shell solid, triangularly ovate, moderately convex or slightly depressed, cardinal area short and narrow, somewhat angulated posteriorly, the post-dorsal region impressedly flattened and narrow.

Surface radiately ridged ; ridges 20, broad, subangulated, not prominently elevated, separated by linear furrows ; there are five faint ribs on the post-dorsal area ; the whole surface crossed by close and fine concentric striæ.

Colour sordid-white, with a few minute chesnut spots about the umbones, and blotches of the same colour about the hinge-line. Interior white, with a faint chesnut-tinge about the post-adductor impression. Inner margin strongly crenated.

Dimensions.—Antero-posterior, 20 ; umbo-ventral, 18 ; sectional diameters, 10·5 mm.

Dredged in life (one example), from 9 to 11 fathoms, off Rapid Head, St. Vincent-Gulf (*Dr. Verco*).

It has not the shape of *P. Gealei* of the same size, but the general style of ornament is the same; though the ribs of the present shell are more depressed and angular, there is no defined interstitial furrow, and the concentric ornament is finer.

Leda Verconis, *spec. nov.* Plate xi., fig. 4.

Shell elongate-ovate, moderately compressed, subequilateral ; concentrically lirate ; covered with a greenish-gray glossy epidermis.

The dorsal margins are equally sloping, the front one a little convex, the posterior slightly concave ; the posterior side is

shortly acuminated; a slightly-curved keel defines the dorsal area, which is striated and moderately impressed; the lunule is very narrow and defined.

The concentric lirae are regular, about 30, stout, elevated, and compressedly-rounded, separated by a little wider, flat furrows; they are slightly incurved as they approach the anterior margin, and more conspicuously so towards the posterior keel, though there is no appearance of a second keel.

Dimensions.—Antero-posterior, 8; umbo-ventral, 5; sectional diameters, 3·5 mm.

Numerous examples dredged in life by Dr. Verco (after whom the species is named) in Yankalilla Bay; also in shell-sand, Holdfast Bay (*R. T.*).

This is not the young of *L. crassa*, which at the same size has a well-pronounced second keel defining the rostral area. It makes an approach to *L. Dohrni*, Hanley, but has not so straight a hinge-line, and is more convex.

A Second Supplement to a List of the Lamellibranch and Palliobranch Mollusca of South Australia.

By Professor Ralph Tate, F.L.S., F.G.S.

[Read September 8, 1891.]

Chiefly through the dredging operations conducted by Dr. Verco during the past summer several additions have been made to the Lamellibranch-fauna of South Australian waters; several of these are of extreme interest, and I am constrained to found no less than six new species, which are described in the preceding pages.

Addenda and corrigenda to previously recorded species are placed within brackets.

Thracia speciosa, *Angas*, Proc. Zool. Soc., 1869, t. 2, fig. 12, p. 48.

Compared with *T. modesta*, this species is oblong and more inequilateral.

A left valve, dredged at 12 fathoms in Yankalilla Bay by Dr. Verco, agrees fairly well with Angas' figure of his *T. speciosa*, though its anterior side is longer, and the height is slightly less. Length, 19·5 mm.; height, 10·5.

Hemimactra cretacea, *Angas.*

Ref.—Spisula cretacea, Angas, Proc. Zool. Soc., 1867, t. 44, fig. 6.

Closely resembles *Anapa triquetra*, but differs generically and particularly by the lateral teeth being striated.

Dead shells, Encounter Bay *(Adcock)* and Aldinga Bay *(Kimber)*. The identification is based on the comparison with authentic specimens from the locality of the type.

[**Lutraria oblonga,** *Gmelin.*

Mr. G. B. Sowerby in Journal of Conchology, October, 1889, p. 155, writes that "This species, under various names, seems to range from the west coast of Ireland eastward to the Philippine Islands, and southward to the Cape. It is taken for granted by most authors that those found in Australian and Indo-Pacific waters must be specifically distinct from the European, but I can find no reliable character by which to distinguish them."

After a careful study of numerous examples of our Lutrariæ and comparison with authentic specimens of *L. oblonga*, I concur with Mr. Sowerby's views, and express the opinion that one species only exists in our waters; therefore the names *L. rhynchæna* and *L. dissimilis* must be relegated to the long catalogue of synonyms under *L. oblonga*. Menke in Moll. Nov. Hollandiæ, p. 46, 1843, would seem to have been the first to identify an Australian Lutraria with the European species, as he records *L. solenoides*, Lamarck, (a recognized synonym of *L. oblonga*) from the west coast of Australia).]

Semele monilis, *Tate, antea*, p. 261.

Aldinga, Moonta, and Yankalilla Bays.

Tellina Vincentiana, *Tate, antea*, p. 262.

Off Rapid Head and Myoponga, and Yankalilla Bay in St. Vincent-Gulf.

[**Tellina modestina,** *Tate, nom. mut.*

Tellina modesta, Sowerby, 1883; non Carpenter *(Angulus modesta)*, Proc. Acad. Nat. Sc. Philadelphia, p. 56, 1865; *T. modesta* (Carp.), Bertin, Nouv. Arch. du Mus., 1878, p. 274.]

Lucinopsis pellucida, *Tate, antea*, p. 263.

Yankalilla Bay, St. Vincent-Gulf.

Chione striatissima, *Sowerby.*

Ref.—Venus striatissima, Sowerby, Thes. Conch., p. 718, t. 157, figs. 103-105; *id.*, Reeve, Conch. Icon., t. 26, f. 135, 1864; *Chione striatissima*, Deshayes.

This species, which is not uncommon in St. Vincent-Gulf and

Encounter Bay, ranging from 10 to 25 fathoms, and not rare as a beach-shell, has been incorrectly referred by me as the young of *C. gallinula*, whereas, at the time, I did not actually know juvenile states of that species.

[**Kellia rotunda,** *Deshayes.*

An examination of living examples proves the presence of a broad and short respiratory canal, proper to *Kellia*. Mr. Adcock reports to me that the species inhabits the interior of freshly-deserted egg-cases of sharks; often many examples, from the state of fry to that of the adult, occur, clinging by byssal threads to the surface of the egg-case. Woodward says that *Kelliæ* creep about freely, and fix themselves by a byssus at pleasure.]

[Genus Ephippodonta.

My description of the animal of *E. McDougalli* proves on examination of less distorted specimens (in spirit) to be incorrect. The mantle-lobes are united, except for a length of about one-third of the animal, at the anterior medial line. The mantle has, however, a narrow marginal reflection coincident with the shell-border; the marginal reflections of each lobe imbricate before and behind, they are papillary externally and shortly ciliate-fringed on the edge. The inner pair of gills are very large and tumidly swollen, they are united behind. The adductor muscles are in near proximity to the hinge-line.

Through the slit of the united mantle-lobes a pointed cylindrical foot and the thickened margins of the inner gills are partially protruded; or the latter, when concealed, produce large swellings of the mantle, these I mistook for a creeping disk.

These characters bring the genus in close relation to *Scintilla*.]

Crassatella carnea, *Tate, antea*, p. 263.

Yankalilla Bay and to north of Rapid Bay *(Dr. Verco)*.

Unio Novæ-Hollandiæ, *Gray.*

Ref.—Proc. Zool. Soc., 1834, p. 57.

Unio cucumoides, Lea, 1840, and Obs., vol. III., p. 30, t. 7, fig. 2, 1843; *id.* Reeve, Conch. Icon., 1868, t. 20, fig. 89.

A black, elongate, narrow, very plicate shell, attenuated and narrowly truncated posteriorly.

Length, $3\frac{1}{2}$ inches; breadth, $1\frac{1}{4}$ inch.

Lagoon near Alice Springs (coll. Mr. Adcock).

The identification is based on Reeve's figure of *U. cucumoides*, though the specimen wants the diversely radiating wrinkled-warts on the posterior side, as described by Gray and Reeve. Smith positively affirms the identity of this species and *U. cucum-*

oides, and is therefore known from the Macquarie, Hunter, and Richmond Rivers.

[**Carditella subtrigona**, *Tate.*

Many living examples of this species were dredged by Dr. Verco in Yankalilla Bay. The shell is covered with a thin epidermis of a pale-horn colour, varied with a more or less diffused flesh-tint. The largest examples have the following dimensions:—Antero-posterior, 7·75; umbo-ventral, 7; and sectional diameters, 5.]

Cardita Gunni, *Deshayes.*

Proc. Zool. Soc., 1852, p. 101; *C. Atkinsoni*, Ten.-Woods.

A suborbicular cordate shell, with from 17 to 19 nodosely squamose ribs about as wide as the furrows. Long., 13; lat., 12 mm.

In deep water off Kangaroo Island; Yankalilla Bay; Encounter Bay; also Tasmania.

Leda Verconis, *Tate*, *antea*, p. 264.

Yankalilla Bay; Holdfast Bay.

Pectunculus sordidus, *Tate*, *antea*, p. 264.

Off Rapid Head, St. Vincent-Gulf.

[**Pectunculus Gealei**, *Angas.*

Proc. Zool. Soc., 1873. t. 20, fig. 5, p. 183.

P. flabellatus, Ten.-Woods, Trans. Roy. Soc., Vict., 1878, p. 61.

P. laticostatus, Angas, P.Z.S., 1878, p. 871.

P. orbicularis, Angas, P.Z.S., 1879, t. 35, fig. 9, p. 420.

P. Beddomei, E. A. Smith, Lamell. Challenger Ex., 1885, p. 255, t. 18, figs. 1-1*b*.

There is no doubt that *P. flabellatus* and *P. Beddomei* are the same, though Woods' diagnosis is not satisfactory; however, the excellent figure of *P. Gealei* (a New South Wales shell) permits one to refer, without hesitation, the species of Woods and Smith to it. *P. orbicularis*, described from a Bass-Straits shell, represents a young stage of the same species, which is remarkable for its long straight hinge-line.]

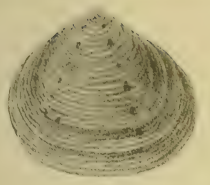
Modiola arborescens, *Chemnitz.*

Mytilus arborescens, Chemnitz, Conch. Cab., vol. 2, t. 198, f. 2016-17.

Modiola arborescens, Reeve, Con. Icon., t. 6, f. 30 (1857).

Modiola picta, Lamarck, An. S. Vert., vol. VI., p. 112 (1819); id. Sowerby, Genera of Shells, fig. 1.

A compressedly-convex cylindrically-oblong shell, white under a pale-yellow highly glossy epidermis, the posterior slope divaricately netted with fine purplish lines.



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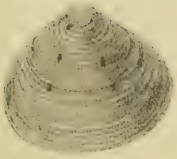

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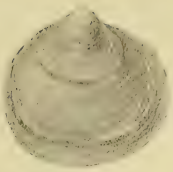

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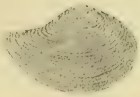

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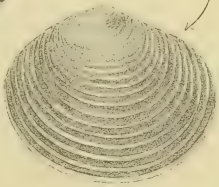

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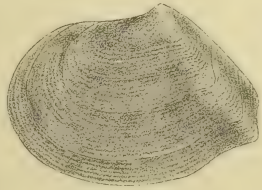


10

H.B. Lith.

HUSSEY & GILLINGHAM LITH

One valve dredged off Troubridge by Mr. E. H. Matthews; several living specimens and detached valves dredged at 14 to 17 fathoms in Yankalilla Bay by Dr. Verco. The largest example measures 30 mm. long by 12 mm. broad.

The habitat of the species was unknown to Lamarck, but he gives Atlantic Ocean with a doubt, Deshayes in 1836 simply repeats him. Reeve refers the species to the West Indies.

This beautiful mussel is, however, recorded by Tenison-Woods, Proc. Roy. Soc., Tasmania, as very rare in Long Bay, Tasmania, and of about 45 mm. long. The South Australian examples are much smaller, but otherwise are comparable with Reeve's figure. Mr. John Brazier writes me, "I dredged *Modiola arborescens* outside Sydney Heads, some 17 years ago, in 45 fathoms, also inside Port Jackson in 18 fathoms."

Terebratula Wyvillei, *Davidson.*

Ref.—Challenger Brach., t. 2, fig. 7-8; id. Trans. Lin. Soc., 1886, t. 2, f. 8-14.

Off South Australia, lat. 42° 42′, long. 134° 10′, depth 2,600 fathoms.

Also Chili, Patagonia, and Falkland Islands.

EXPLANATION TO PLATE XI.

Fig.
1-1a. Crassatella carnea. Slightly enlarged.
2. Lucinopis pellucida. 2 x.
3. Latirofusus nigrofuscus. 2 x.
4. Leda Verconis. 3 x.
5. Leiopyrga octona. 3 x.
6. Siphonalia oligostira. Nat. size.
7-7a. Semele monilis. Nat. size, and magnified portion.
8. Pectunculus sordidus. 2 x.
9. Diala magna. 3 x.
10. Tellina Vincentiana. 2 x.

A Bibliography and Revised List of the Described Echinoids of the Australian Eocene, with Descriptions of some New Species.

By Professor Ralph Tate, F.L.S., F.G.S., &c.

[Read October 6, 1891.]

I.—BIBLIOGRAPHY OF THE EOCENE ECHINOIDS OF AUSTRALIA.

1834. Sturt, "Two Expeditions in the Interior of Southern Australia," gives drawings of three Echinoids from the Eocene calciferous sandstone of the River Murray Cliffs, which can very safely be referred to familiar species known to occur there:—*Spatangus Hoffmanni*, Goldfuss, t. 3, f. 10, is *Lovenia Forbesi; Scutella*, sp., t. 3, f. 9, represents the underside of *Monostychia australis;* whilst the *Echinus*, t. 3, f. 11, is unrecognizable, but may be *Psammechinus Woodsi* or *Paradoxechus novus*, more probably the latter.

1862. Rev. J. E. Tenison-Woods, "Geological Observations in S. Aust.," copies the figures of Sturt's *Echinoids*, calling the *Spatangus S. Forbesii*, and adds two figures of an *Echinolampas* from Mount Gambier.

1864. Dr. Duncan, "Annals and Mag. Nat. Hist.," p. 165, figures *Hemipatagus Forbesi*, and records *Clypeaster folium*, Ag., but which is now recognised as *Monostychia australis*, Laube, and not the species of Agassiz.

1867. Rev. J. E. Tenison-Woods, "Trans. Adelaide Phil. Soc.,' illustrates:—*Echinolampas Gambierensis*, n. sp., figs. 1*a*-1*c*; *Hemipatagus Forbesi*, (Woods and Duncan), figs. 3*a*-3*d*; and *Hemiaster Archeri*, n. sp., figs. 2*a*-2*d*. The last is the *Echinolampas* figured in his "Geol. Observations."

1869. Dr. G. C. Laube, "Sitz. d. K. Akad. d. Wissenchaft. Wien," vol. LIX., p. 193, describes the following species from the River Murray Cliffs:—*Psammechinus Woodsi*, n. sp.; *Paradoxechinus novus*, n. sp.; *Monostychia australis*, n. sp.; *Catopygus elegans*, n. sp.; *Echinolampas ovulum*, n. sp.; *Micraster brevistella*, n. sp.; *Eupatagus Murrayensis*, n. sp.; *E. Wrighti*, n. sp.; and *Hemipatagus Forbesi*, Tenison-Woods. I have no hesitation in

referring the *Echinolampas* to *E. Gambierensis* and the *Micraster* to *M. Archeri*, T.-Woods *(Hemiaster)*.

1875. R. Etheridge, jun., "Quarterly Journal Geological Society," vol. XXXI., p. 444 *et seq.*, gives a list of the Tertiary Echinodermata of Australia, describes *Hemipatagus Woodsii*, n. sp., and illustrates some details of structure in respect of *Psammechinus Woodsii* and *Micraster brevistella* not shown in Laube's drawings.

1876. Prof. Duncan, "Quarterly Journal Geological Society," vol. XXXIII., describes *Leiocidaris australiæ*, *Temnechinus lineatus*, *Arachnoides Loveni*, *A. elongatus*, *Rhynchopygus dysasteroides*, *Echinobrissus australiæ*, *Holaster australiæ*, *Maretia anomala*, *Eupatagus rotundus*, *E. Laubei*, and *Megalaster compressus* as new species, *Megalaster* as a new genus. In addition there are "Supplementary Notes" on previously-described species, and the following exoteric species are recorded:—*Pygorhynchus Vassali*, Wright; *Schizaster ventricosus*, Gray; *Echinarchnius parma*, Gray; *Echinanthus testudinarius*, Gray.

1877. Prof. Tate, "Quarterly Journal Geological Society," vol. XXXIII., p. 257, fig. 2, describes *Salenia tertiaria*, n. sp., from Aldinga Cliffs, and records 15 genera additional to the echinodermal fauna of the Australian Tertiary.

1877. R. M. Johnston, "Proc. Roy. Soc., Tasmania," p. 116, records from the Eocene of Table Cape, Tasmania, *Micraster brevistella*, Laube, *Hemipatagus Woodsii*, Etheridge, and *Micraster Etheridgei*, n. sp. The author says of the last that the dorsal surface is very imperfectly preserved, but in his "Geol. of Tasmania," p. 231 (1888), it appears as *Monostychia Etheridgei*. It will serve no useful purpose to retain Mr. Johnston's species, as it is insufficiently diagnosed to permit of a safe generic interpretation, and the absence of a figure makes its attachment to known species a most hazardous venture.

1879. Prof. McCoy, "Prodromus Palæontology of Victoria," Decade VI., figures and describes *Lovenia Forbesi* and *Monostychia australis*.

1882. Prof. McCoy, "Prodr. Pal. Victoria," Dec. VII., figures three new species of *Pericosmus*, and believes that *Megalaster compressus* may be the same as his *P. compressus*, on which the fascioles have been obliterated.

1884. Prof. Tate, "Trans. Roy. Soc., S. Aust.," pp. 37 *et* 41, gives a list of the Echinodermata of the River Murray

Cliffs, and indicates the identity of *Echinolampas ovulum* and E. *Gambierensis*.

1885. Prof. Tate, "Southern Science Record," Janry., p. 4, describes *Fibularia gregata*, n. sp., and *Linthia antiaustralis*, n. sp.

1887, Prof. Duncan, "Quart. Journ. Geol. Soc.," vol. XLIII., p. 411 *et seq.*, gives a list of species of the Echinoidea of the Australian Tertiaries, which is essentially the same as his former one published in 1877, as the only additional species admitted are *Salenia tertiaria* and McCoy's three species of *Pericosmus*. However, a revision is made of the specific characters of some species; a new genus *Orthologhus* is erected for his *Temnechinus lineatus; Rhynchopygus dyasteroides* is altered to *Holaster difficilis;* but *Megalaster* is retained, as is also *Clypeaster folium*, Ag., but as a variety; of living species *Echinarchinus parma* is dropped out, but *Schizaster ventricosus* is retained on an imperfect specimen.

1888. Prof. Tate, "Proc. Roy. Soc., New South Wales," p. 240 et seq., gives a list of genera of Echinoids, and the number of species to each from the Older Tertiary of Australia, amounting to 29 genera and 49 species. The following emendations have arisen:—*Temnechinus* includes *Paradoxechinus* and *Orthologhus; Murravechinus* (n. gen.) is a *Cœlopleurus; Arachnoides* is *Monostychia*, but the genus *Arachnoides* will stand, as a species has since been found in the Miocene at the Gippsland Lakes; *Cardiaster* is to be added, though inadvertently omitted, it was included in his list of 1877; *Rhynchopygus* should be expunged.

1889. Prof. Duncan, "Journ. Linnean Society, London," in a revision of the Genera of the Echinoidea, makes special reference to a few of our Tertiary species; but persists in the retention of his genus *Megalaster*.

1890. A. C. Gregory, "Geological Magazine," has anticipated me by describing several new species, some belonging to genera not hitherto known to form part of the Echinodermal fauna of the Australian Tertiary, except through their introduction in my lists of genera published in 1877 and 1888; *e.g.*, *Hemiaster*, *Cardiaster*, and *Cassidulus*. All of them have been distributed to various public museums with M.S. names, which are added as synonyms in the appended "List of Described Species" for the information of those to whom they have been sent.

Table of Genera, showing their Geological Range.

The Echinoids of the Eocene of Australia belong to the following 28 genera, the geological range of which is indicated. From an analysis of their distribution in time, it may safely be concluded that this Echinoid fauna is Eocene, rendered more pronounced by the survival of a few Cretaceous genera. The sign * denotes that the genus is restricted to the Australian region for the geologic age indicated.

	Trias.	Jurassic.	Cretaceous.	Eocene.	Miocene.	Recent.
Cidaris ...	x	x	x	x†	x	x
Salenia ...	.	.	x	x	.	x
Cœlopleurus	.	.	.	x	x	x
Paradoxechinus	.	.	.	*	.	.
Orthologhus	.	.	.	*	.	.
Psammechinus	.	.	x	x†	x	x
Scutellina	.	.	.	x	.	.
Fibularia	.	.	.	x	x	x
Clypeaster	.	.	.	x	x	x
Monostychia	.	.	.	*†	.	.
Laganum	.	.	.	x	x	x
Echinobrissus	.	x	x	x†	.	.
Cassidulus	.	.	x	x	.	.
Pygorhynchus	.	.	x	x	x	.
Studeria	.	.	.	x	.	x
Echinolampas	.	.	.	x†	x	x
Holaster	.	.	x	*†	.	.
Cardiaster	.	.	x	*†	.	.
Hemiaster	.	.	x	x	x	x
Pericosmus	.	.	?	x†	.	.
Linthia ...	.	.	x	x	?	x
Schizaster	.	.	.	x†	x	x
Micraster	.	.	x	x†	.	.
Brissus ...	.	.	.	x	x	x
Toxobrissus	.	.	.	x	x	.
Maretia	.	.	.	x	x	x
Eupatagus	.	.	.	x†	x	x
Lovenia...	.	.	.	x†	x	x

The number of described species admitted is 35; but the collection in the University Museum contains about 20 species of recorded genera which yet remain undiagnosed. In the following catalogue of described species the locality-names printed in capitals are those yielding the type-examples. The list of localities is very incomplete, as I have not consulted with my various correspondents, and those additional to the original ones are supplied from my own personal knowledge.

† Also in New Zealand.

II.—LIST OF DESCRIBED SPECIES.

FAMILY CIDARIDÆ.

Genus Cidaris, *Leske*, 1778.

Subgenus Leiocidaris, *Desor*.

1. Leiocidaris australiæ, Duncan, Q. J. G. S. vol. XXXIII., p. 45, t. 3, f. 1, 2, 1877.

Localities.—Cape Otway, Aldinga Cliffs, R. Murray Cliffs, and generally in all fossiliferous strata of Eocene age.

FAMILY SALENIIDÆ.

Genus Salenia, *Gray*, 1835.

2. Salenia tertiaria, Tate, Q. J. G. S. vol. XXXIII., p. 256, figs. 2*a*-2*c*, 1877; *id*, Duncan, Ann. and Mag. Nat. Hist., 1878, vol. II., p. 61; A. Agassiz, Challenger Echini, p. 51 (1881).

Localities.—Aldinga Cliffs; Wilson Bluff, Gt. Aust. Bight.

3. Salenia globosa, Tate, see post.

Locality.—Aldinga Cliffs.

FAMILY ARBACIDÆ.

Genus Cœlopleurus, *Agassiz*, 1840.

4. Cœlopleurus paucituberculatus, Gregory, Geol. Mag., 1890, p. 486, t. 14, figs. 4-5. *Murravechinus spinosus*, Tate, ms.

Locality.—River Murray Cliffs, near Blanchetown.

FAMILY TEMNOPLEURIDÆ.

Genus Paradoxechinus, *Laube*, 1869.

5. Paradoxechinus novus, Laube, Akad. d. Wissensch. Wien, 1869, figs. 2-23.

Localities.—R. Murray Cliffs at Mannum; Aldinga Cliffs.

Genus Ortholophus, *Duncan*, 1887.

6. Ortholophus lineatus, Duncan, Q. J. G. S., vol. XLIII., p. 415, 1887. *Temnechinus lineatus*, Duncan, Q. J. G. S., vol. XXXIII., p. 46, t. 3, figs. 3-5.

Locality.—Mordialloc.

FAMILY ECHINIDÆ.

Genus Echinus, *Linnæus*.

Subgenus Psammechinus, *Agassiz*, 1846.

7. Psammechinus Woodsi, Laube, Akad. d. Wiss. Wien, 1869, figs. 1-1*b*; *id*, Etheridge, Q. J. G. S., vol. XXXI., t. 21, fig. 10, 1875; Duncan, Q. J. G. S., vol. XXXIII., p. 64.

Localities.—River Murray Cliffs, *(Laube, R. T.)*, Aldinga Cliffs.

FAMILY FIBULARIIDÆ.

GENUS FIBULARIA, *Lamarck*, 1816.

8. FIBULARIA GREGATA, Tate, Southern Science Record, January, 1885, p. 4.

Localities.—Eocene, RIVER MURRAY CLIFFS at Mannum; Aldinga Cliffs; Surveyors' Point and Muloowurtie, Yorke-Peninsula; banks of the River Bremer, below Callington. All in South Australia.

GENUS SCUTELLINA, *Agassiz*, 1841.

9. SCUTELLINA PATELLA, Tate, see post.

Localities.—RIVER MURRAY CLIFFS; Mount Gambier; Muddy Creek.

FAMILY CLYPEASTRIDÆ.

GENUS CLYPEASTER, *Lamarck*, 1816.

10. CLYPEASTER GIPPSLANDICUS, McCoy, Prod. Pal. Victoria, Dec. VI., 1879 t. 49. *Echinanthus testudinarius* (Gray), Duncan, Q. J. G. S., vol. XXXIII., p. 46, 1877.

Localities.—MITCHELL RIVER, near Bairnsdale *(McCoy, R. T.,* &c.); River Murray Cliffs *(R.T.)*; Spring Creek, near Geelong, *(R. T.)*; Corio Bay; Muddy Creek; Mordialloc *(McCoy, R. T.,* &c.),

GENUS MONOSTYCHIA, *Laube*, 1869.

11. MONOSTYCHIA AUSTRALIS, Laube, Akad. d. Wiss. Wien., 1869, p. 190, figs. 3-3*c*. *Clypeaster folium* (Agassiz), Duncan, 1864. *Arachnoides australis*, Duncan, Q. J. G. S., 1877, p. 48. *Monostychia australis*, McCoy, Prod. Pal. Victoria, Dec. VI., 1879, t. 50, figs. 5-7. *Clypeaster (Monostychia) australis*, Duncan, Q. J. G. S., 1877, p. 420. Varieties, *Arachnoides Loveni*, Duncan, Q. J. G. S., 1877, p. 47, t. 3, figs. 6-7; *Arachnoides elongatus*, Duncan, *id.*, p. 48, t. 3, fig. 8.

Localities.—RIVER MURRAY CLIFFS, *(Laube, McCoy, R. T.,* &c.); Mount Gambier limestone *(T. Woods)*; Mordialloc *(Duncan, McCoy.)*

FAMILY CASSIDULIDÆ.

GENUS CASSIDULUS, *Lamarck*, 1801.

12. CASSIDULUS LONGIANUS, Gregory, Geol. Mag. 1890, p. 482, t. 13, figs. 1-3. *Cassidulus australis*, Tate ms.

Localities.—In the glauconitic limestone, ALDINGA CLIFFS; limestone, Roll's Point, Kingscote, Kangaroo Island.

GENUS PYGORHYNCHUS, *Agassiz*, 1839.

13. PYGORHYNCHUS VASSALI, Wright, Q. J. G.S. vol. XX., t. 22, figs. 6*a*-6*c* (1864); Duncan *id.*, vol. XXXIII., p. 51.

Localities.—East of the GLENELG RIVER; Mannum, River Murray.

GENUS CATOPYGUS, *Agassiz*, 1836.

SUBGENUS STUDERIA, *Duncan*, 1889.

14. CATOPYGUS (Studeria) ELEGANS, Laube. *C. elegans*, Laube, Akad. d. Wiss. Wien., 1869, figs. 8-8*c*., p. 10.

Locality.—RIVER MURRAY CLIFFS at Mannum.

GENUS ECHINOLAMPAS, *Gray*, 1825.

15. ECHINOLAMPAS GAMBIERENSIS, Tenison-Woods, Proc. Adelaide Phil. Soc., 1867, figs. 1*a*-1*c*; Tate, Trans. Roy. Soc., South Australia, 1884, p. 37. *Echinolampas ovulum*, Laube, Akad. d. Wiss. Wien., 1869, p. 191; Duncan Q. J. G. S., vol. XXXIII., p. 66, 1877; vol. XLIII., p. 420; Gregory, Geol. Mag., 1890, t. 13, figs. 7-8, p. 483.

Localities.—River Murray Cliffs *(Sturt, Laube, R. T.)*; MOUNT GAMBIER LIMESTONE *(T. Woods)*; Mitchell River, Bairnsdale *(Gregory)*.

16. ECHINOLAMPAS POSTEROCRASSUS, Gregory, Geol. Mag., 1890, t. 13, figs. 4-6, p. 483. *E. Gambierensis*, pars. Tate ms.

Locality.—Glauconitic limestone, ALDINGA CLIFFS.

GENUS ECHINOBRISSUS, *Breyn.*, 1732.

17. ECHINOBRISSUS AUSTRALIÆ, Duncan, Q. J. G. S., vol. XXXIII., pp. 50, 66, t. 3, fig. 11, 1877.

Locality.—CAPE OTWAY.

18. ECHINOBRISSUS VINCENTINUS, Tate, see post.

Localities.—ALDINGA BAY and near Ardrossan.

FAMILY ANANCHYTIDÆ.

GENUS HOLASTER, *Agassiz*, 1840.

19. HOLASTER AUSTRALIÆ, Duncan, Q. J. G. S., vol. XXXIII., p. 51, t. 3, figs. 12, 13, 1877; *id*, Q. J. G. S., 1887, p. 420, wdct. *Rhynchopygus dysasteroides*, Duncan, Q. J. G. S., 1877, p. 49, t. 3, figs. 9-10. *Holaster difficilis*, Duncan, Q. J. G. S., vol. XLIII., 1887, p. 421.

Localities.—Castle Cove, CAPE OTWAY; River Murray Cliffs; mouth of the R. Onkaparinga; Mount Gambier; west side of St. Vincent-Gulf.

Specimens comparable with Duncan's figures, obtained from a soft polyzoal limestone at the mouth of the Onkaparinga, have a fairly well-defined suranal fasciole. The species is very variable in shape, some examples are more depressed than the type, whilst in the opposite direction others are moderately elevated like *H. Trecensis*, Leymerie; and a few examples are subconic with a proportion of the long diameter to the height of three to two.

Duncan admits that *Rhynchopygus dysasteroides* is a crushed *Holaster*, and it would have been well if he had added—and

probably of *H. australis*, with some specimens of which it agrees in outline.

GENUS CARDIASTER, *Forbes*, 1852.

20. CARDIASTER TERTIARIUS, *Gregory*, Geol. Mag., 1890, t. 14, figs. 2-3, p. 484.

Locality.—Glauconitic limestone, ALDINGA CLIFFS.

The good state of preservation of many of my specimens permits me to state that there is no lateral fasciole.

21. CARDIASTER LATECORDATUS, Tate, see post.

Locality.—Glauconitic limestone, Aldinga Cliffs.

FAMILY SPATANGIDÆ.

GENUS HEMIASTER, *Desor.*, 1857.

22. HEMIASTER PLANEDECLIVIS, Gregory, Geol. Mag. 1890, t. 14, figs. 6-7, p. 488. *H. latifrons*, Tate, ms.

Localities.—RIVER MURRAY CLIFFS; glauconitic limestone; Aldinga Cliffs.

GENUS PERICOSMUS, *Agassiz*, 1847.

23. PERICOSMUS COMPRESSUS, McCoy, Prod. Pal. Victoria, Dec. VII., 1882, t. 67, f. 2, t. 68. *Megalaster compressus*, Duncan, Q. J. G. S., 1877, p. 62, wdct. *Pericosmus McCoyi*, Gregory, Geol. Mag., 1890, p. 485. *Megalaster compressus*, Duncan, P. L. S., 1889, p. 221.

Localities.—RIVER MURRAY CLIFFS *(Duncan, Tate)*; Spring Creek, near Geelong *(McCoy, R. T.)*.

24. PERICOSMUS GIGAS, McCoy, Prod. Pal. Victoria, Dec. VII., tabs. 64, 65.

Localities.—BANKS OF THE MURRAY, near junction with the Darling, and at Corio Bay, Port Phillip *(McCoy)*.

25. PERICOSMUS NELSONI, McCoy, Prod. Pal. Victoria, Dec. VII., t. 66, figs. 1-2, t. 67, fig. 1.

Locality.—WAURN PONDS, near Geelong.

GENUS LINTHIA, *Merian*, 1853.

26. LINTHIA ANTI-AUSTRALIS, Tate, Southern Science Record, January 1885.

Locality.—RIVER MURRAY CLIFFS, near Morgan.

GENUS SCHIZASTER, *Agassiz*, 1847.

27. SCHIZASTER ABDUCTUS, Tate, see post.

S. ventricosus (Agassiz), Duncan, Q. J. G. S., 1877, p. 61.

Localities.—RIVER MURRAY CLIFFS; Moorabool River, a cast (Mr. Sweet).

GENUS MICRASTER, *Agassiz*, 1840.

28. MICRASTER ARCHERI, Tenison Woods sp. *Echinolampas* sp. Tenison Woods, Geol. Obs., p. 77, wdcts., 1862. *Hemiaster*

Archeri, Tenison Woods, Proc. Phil. Soc., Adelaide, 1887, figs. 2*a*-2*d*. *Micraster brevistella*, Laube, Akad. d. Wiss. Wien., 1867, p. 192, fig. 8; Etheridge, Q. J. G. S., vol. XXI., p. 447, figs. 11, 12, 1875.

This species has an ill-defined fasciole truncating the posterior ambulacra, and extending nearly to the anterior pair, and thus makes a passage to *Brissopsis*; on this account I quoted it as *Brissopsis Archeri*, in Trans. Roy. Soc., 1884, p. 41.

Localities.—River Murray Cliffs; Mount Gambier *(Ten. Woods)*; Table Cape *(Johnston)*.

Genus Maretia, *Gray*, 1855.

29. Maretia anomala, Duncan, Q. J. G. S., vol. XXXIII., p. 52, t. 4, figs. 1-4, 1877.

Locality.—Mouth of the Sherbrook River, Victoria.

Genus Eupatagus, *Agassiz*, 1847.

30. Eupatagus Wrighti, Laube, Akad. d. Wiss., Wien, p 195, fig. 13, 1867.

Locality.—River Murray Cliffs (*Laube, R. T.*).

31. Eupatagus Murrayensis, Laube, *op. cit.*, p. 196, fig. 4, 1867.

Locality.—River Murray Cliffs (*Laube, R. T.*).

32. Eupatagus rotundus, Duncan, Q. J. G. S., vol. XXXIII., p. 53, t. 3, figs. 14-17.

Locality.—River Murray Cliffs (*Laube, R. T.*).

33. Eupatagus Laubei, Duncan, *op. cit.*, p. 55, t. 3, fig. 18.

Locality.—Mouth of the Sherbrook River, Victoria.

34. Eupatagus decipiens, Tate, see post.

Pericosmus compressus, Gregory, Geol. Mag., 1890, t. 14, fig. 1.

Localities.—In a polyzoal rock at the Mouth of the River Onkaparinga; and in a calciferous sandstone, Aldinga Cliffs, south side of Port Willunga Jetty.

Genus Lovenia, *Agassiz* and *Desor*, 1847.

35. Lovenia Forbesi, Tenison-Woods. *Spatangus Hofmanni*, Sturt (non Goldfuss), Two Exped., 1834, t. 3, fig. 10. *Spatangus Forbesi*, Tenison-Woods, Geol. Observ., 1862, p. 75, wdct. *Hemipatagus Forbesi*, Duncan, Ann. Mag. Nat. His., 1864, t. 6, figs. 3*e-f*; Laube, Akad. d. Wiss., Wien, 1867, p. 193, figs. 4-4*b*. *Hemipatagus Woodsi*, Etheridge, Q. J. G. S., 1875, t. 21, figs. 1-7. *Lovenia Forbesi*, Duncan, Q. J. G. S., 1877, p. 56, t. 4, figs. 5-8; McCoy, Prod. Pal. Victoria, Dec. VI., t. 60, fig. 1-4, 1879.

Localities.—Generally distributed; in polyzoal limestone- and calciferous sandstone- formations of Eocene age, in South Australia, Victoria, and Tasmania.

III.—DESCRIPTIONS OF NEW SPECIES.

Salenia globosa, *spec. nov.*

Test circular in outline, subglobose; apical system relatively small, hemispheric; vent excentric, irregularly pentagonal. Interambulacral tubercles large, seven in each vertical row; interambulacral zones comparatively wide, each at the ambitus about four times as wide as the ambulacrum in the same region.

Ambulacral zones with two outer rows of small secondary tubercles, between which are four oblique rows of smaller tubercles and some scattered granules. Pores in pairs, oblique; one pair to each ambulacral plate.

Peristome, smaller in extent than the apical system, with very shallow incisions.

Dimensions.—Height, 13·5; width, 18 mm.

Locality.—Glauconitic limestone, Aldinga Cliffs (2 exs.)

This second species of *Salenia* from our Tertiary is separable from *S. tertiaria* by its globose form and by having seven, in place of six, primary tubercles in each interambulacral row. Of the very many specimens of *S. tertiaria* which I have had under observation, I find no tendency to become conoid; it is, moreover, a much larger shell, the corresponding measures for *S. tertiaria* being 8·5 and 14, and 8 and 17·5. In shape this new species is exceedingly like the Cretaceous *S. gibba*, Agassiz, but is distinguished from it, among other characters, by having one pair of pores to each ambulacral plate, a character possessed by all Tertiary and the Recent species.

Scutellina patella, *spec. nov.*

Test large for the genus; subcircular to subdecagonal in outline; regularly conic.

Base regularly deeply-concave, the ambital margin tumid and narrowly defined abactinally.

Peristome central, nearly circular; moderately large; periproct supra-marginal, circular, very small as compared with the peristome.

Genital pores four; poriferous zones concealed beneath the ornament.

Interior with well-developed vertical partitions radiating towards the peristome.

Tubercles uniform, small, and perforate, rather wide apart, surrounded by scrobiculate ornament.

Dimensions of two examples:—Longitudinal diameter, 24, 22; transverse diameter, 22·5, 21; height, 7·5, 6.

Localities.—Calciferous sandstones of the River Murray Cliffs (common); white polyzoal limestone at Mount Gambier; polyzoal sands, Muddy Creek.

By its supra-marginal periproct this new *Scutellina* is related to *S. supera*, Agassiz; but its circular outline and high summit distinguish it; it is, moreover, very much larger

Echinobrissus Vincentinus, *spec. nov.*

Subconvex; ambitus ovate-subpentagonal, anteriorly rounded, sides arched to near the posterior border, which is roundly biangulated; base longitudinally concave, tumid mediolaterally. The anal sulcus is moderately deep, wide, rounded behind, and extends to more than half or nearly two-thirds the length of the post-apical radius. The apical disc is at about three-fifths of the long diameter from the front. The greatest width is in a plane intersecting the anal sulcus at its middle. The tuberculation is rather large, and largest on the actinal surface. There are no pores below the subpetaloid parts of the ambulacra, but pores in a single series occupy the ambulacra converging on the peristone.

Dimensions.—Longitudinal, 28·5; transverse, 23·; sectional diameters, 12· mm.

Localities. - Common in the glauconitic limestones, Aldinga Bay; also at Muloowurtie, near Ardrossan, York-Peninsula.

This species has the same general outline of *E. Morrisi*, Forbes, but is more depressed and has a very much wider sulcus, not narrow and acute behind. Another Cretaceous species which comes near to it, is *E. lacunosus*, Goldfuss, Petref. Germ., p. 141, t. 73, fig. 8, but it is more narrowed at the front, more angulated behind, the anal sulcus is much longer, and the apical system is more excentric. *E. Australiæ*, Duncan, has an elliptical outline.

Cardiaster latecordatus, *spec. nov.*

Test orbicular-cordate, as seen from above, with a deep and wide anterior groove, which is tumidly keeled at its sides, and extends from the vertex to the peristome; the base is slightly concave longitudinally, and flattened laterally; the ambitus is slightly tumid, and the abactinal surface is depressedly convex.

The apical system is excentric, and is a little posterior to the vertex.

From the vertex the surface slopes rapidly in all directions, most so to the posterior margin, which is slightly rostrated truncate; the posterior face is wide, but short, and is slightly concave vertically. The posterior slope is interrupted by a faint keel; and the anterior by the tumid keels bordering the anterior groove, transverse to which the anterior lateral areas are slightly concave. The anterior groove is very wide, but contracts a little at the ambitus, where it is deepest.

The ambulacra are flush, the anterior ambulacra slightly arched, are more prominent, the poriferous zones in each of the posterior ambulacra diverging more rapidly than those of the

anterior pair. The interstitial ridges between the conjoined pores of the paired ambulacra are minutely granulated.

The test is minutely granular, and thickly studded with minute tubercles, which become conspicuous on the anterior interambulacra, more especially on the keels of the anterior groove.

Dimensions.—Longitudinal diameter, 82; transverse diameter at 30 mm. from the front, 87; height, 35 mm.; width of groove at ambitus, 11; in a medial position, 16 mm.

Locality.—Glauconitic limestone, Aldinga Cliffs (one ex.).

The conic abactinal surface distinguishes *C. latecordatus* from other depressed species of the genus, whilst its broadly cordate outline and large anterior groove are equally prominent characters.

Schizaster abductus, *spec. nov.*

Synonyms.—? *Schizaster ventricosus*, Duncan, Q. J. G. S., 1877, p. 61; *id*, 1887 (*non* Gray). ? *Schizaster exoletus*, Hutton, Cat. Tert. Echinod., New Zealand, 1873, p. 43.

Somewhat like *S. ventricosus*, but is proportionately broader and more depressed, has less-tumid sides, the posterior-median keel is less pronounced, and the outline is not so angular posteriorly. The dorsal slope rises regularly from before backwards, culminating in the posterior extremity of the projecting post-median keel, whilst the subanal area is broad and concavely depressed; characters so strikingly different from *S. ventricosus* as not to permit a confusion of the two species. The anterior petals are in broader and shallower grooves, which are less-arched at the apex, so that they are markedly divergent from the odd ambulacrum; whilst in *S. ventricosus* they are nearly parallel. The posterior petals are also less divergent than in *S. ventricosus*, and the odd ambulacrum is in a narrower and shallower furrow, which only slightly indents the ambitus. The vertex is, moreover, less excentric.

Comparative dimensions of the two species in millimetres:—

	Length.	Breadth.	Height.
S. ventricosus ...	42	35	33
S. abductus ...	58	55	34

Localities.—In the Eocene calciferous sandstone of the River Murray Cliffs, near Morgan (two perfect exs.); Moorabool River, near Geelong (Mr. Sweet, a cast).

Professor Duncan, *op. cit.*, has determined "a large specimen partly in the form of a cast from the Adelaide-district" to belong to the living *S. ventricosus*, but I am disposed to regard it as the present species which is the only one of the genus as yet found in the Australian Tertiary. Under these circumstances it would be unsafe to admit Prof. Duncan's identification on such imperfect material, and the name should be expunged from our

list. The same author rejects *S. ventricosus* as Australian, whereas Gray's type is from West Australia, and the species is known from Southern Australian waters.

Professor Hutton, *op. cit.*, describes a *Schizaster* from the Oamaru formation under the name of *S. exoletus*. The type-specimen is before me, it is an imperfect cast, apparently of a *Schizaster*, and may be identical with the species from the River Murray Cliffs. The uncertainty of the identification makes it desirable to attach a different name to our fossil.

Eupatagus decipiens, *spec. nov.*

Synonyms.—Pericosmus compressus, Gregory, Geol. Mag., 1890, t. 14, fig. 1, p. 485 (non *Megalaster compressus*, Duncan; non *Pericosmus compressus*, McCoy).

There cannot be a doubt that *Megalaster* was founded on a *Pericosmus* of which the fascioles had been obliterated, this is not an unusual circumstance with specimens of *P. compressus* obtained from the raggy limestones at Mannum, on the River Murray, whilst, on the other hand, specimens of the same species from the soft calciferous sandstone near Blanchetown, 60 miles higher up the river, have the characteristic fascioles of the genus, well-displayed, such as are illustrated by McCoy in his figures of the species. *P. compressus*, McCoy, and *Megalaster compressus*, Duncan, are certainly the same species. Gregory considers, however, the two to be distinct, and refers to Duncan's species a fossil from the Aldinga Cliffs, whilst the Murravian species he calls *P. McCoyi*. He has, however, overlooked the fact that Duncan's type came from the Murray Cliffs. In other words, *Pericosmus compressus* of Gregory does not represent the Murravian fossil; indeed, it is generically different, being a *Eupatagus*. I have been long familiar with the species, which is represented in the University Museum by numerous well-preserved examples, and propose for it the name as cited above.

The presence of tubercles on the abactinal surface, though small for the genus, is alone sufficient to afford a clue to its right generic location. The excellent drawing and comparative characters given by Mr. Gregory make it unnecessary to furnish a formal diagnosis of the species. Its shape and the paucity and smallness of the abactinal tubercles afford the leading distinguishing characters of this large species of *Eupatagus*.

Further Notes on the Habits and Anatomy of Notoryctes typhlops.

By E. C. Stirling, M.A., M.D., F.R.C.S., Eng., C.M.Z.S.,

Lecturer on Physiology in the University of Adelaide, Hon. Director of the South Australian Museum.

[Read October 6, 1891.]

Plate XII.

Mr. Bishop, of the Idracowra Station, to whom I have expressed myself indebted for many interesting facts concerning the habits of *Notoryctes typhlops*, has been good enough to supply me with further information on the subject since the date of our meeting in Central Australia in June, 1891.

It may be remembered that in my previous communication to this Society (vol. XIV., pt. 1) I mentioned that, up to the time of its publication, it had not been found possible in any case to keep a living specimen in captivity for more than a very short time. Shortly after our overland party had passed through the Idracowra country, however, Mr. Bishop was able, by careful management, to keep one alive and in good health for several weeks—indeed, so successful was he in meeting its requirements, that he expressed himself confident of being able to bring a living specimen to Adelaide. This, however, was unfortunately not to be, for in spite of all the care devoted to it, the little animal died before its owner could make his intended visit southwards. Nevertheless, the comparatively lengthened period of its captivity gave excellent opportunities for some careful observations, which are now recorded here.

From the contents of Mr. Bishop's letters to me, I compile the following statement by way of supplement to the particulars given in the paper referred to :—

Having had a living specimen brought to him on the 15th June, he kept it in a box of sand, in which was placed a tussock of porcupine grass *(Triodia irritans)*, so as to imitate its natural surroundings as nearly as possible. At the same time precautions against exposure to cold were taken by covering up the box with blankets, and the sand in the box was frequently changed, the fresh supply being first warmed and moistened. It was fed on the "witchety" previously referred to, two or three small

grubs or a single large one being given daily. These it ate with such evident eagerness and avidity as to suggest that the animal was accustomed to that kind of food. Occasionally it was offered beetles of a species that is found under the porcupine clumps, but though these disappeared from the box, it is not certain that they were actually eaten. Ants, also, were tried with a previous specimen, but it seemed as if it was the *Notoryctes* which ran the risk of being eaten. Strong support is afforded to the suggestion that the "witchety" forms a part, at least, of its diet by the fact that, as previously observed, acacias are plentiful in the sandhills, which seem to be the natural haunt of the animal, and the larvæ in question are found in their roots at a depth of a foot or more. The suggestion is also confirmed by the statements of the natives and by the observations of Mr. Bishop himself, who found traces of underground burrowings around the stems of the acacia bushes. Still, it is not clear how the "witcheties," which are buried in the wood, are dislodged.

The aborigines declare that in the cold weather "oor-quámata no more walk about," and that they like damp sand, which confirms the statement previously made that they can only be found in warm weather after rain. Nevertheless, on one occasion two living specimens were placed, with the usual precautions, in a box containing two feet of damp sand, but they were found dead after the succeeding frosty night, though the box was well protected ; the result being, in Mr. Bishop's opinion, due to the fact that there was not a sufficient depth of sand to enable them to get out of range of the effect of the frost, and he thus believes that in their wild state they must burrow to a considerable depth. With a winter experience of the climate in question, I do not think the frost, though undoubtedly sharp at times, could ever penetrate far below the surface of the ground.

When inspected in the box the oor-quámata would usually be found lying curled up in the sand, but not covered by it ; and when the hand was put down immediately in front the little animal would climb into it and "claw it all over." It seemed quick of hearing, and always awakened immediately on lifting the lid of the box. A very slight whistling noise was sometimes made while the specimen, kept so long in captivity, was burrowing about in the box ; but it was not certain whether this was a respiratory or a true voice sound ; and a previous specimen was heard, when held, to make a faint chirping like that of a newly-hatched chick. None of the other specimens, however, emitted any sound that was audible.

Whenever the sand was changed by a fresh, warm, and moist supply the animal immediately commenced to burrow, and on warm sunny days, when it was let out in the open, it would, if the

sand were hard, run a little way fairly quickly; but wherever the surface was soft it would begin burrowing directly, and, as soon as it had got a fair start, it progressed with great rapidity, though not so quickly as is suggested by a statement recorded in my previous paper.

I had specially commissioned Mr. Bishop to make all possible endeavor to secure a female with young, or at least to ascertain from the natives something about its breeding habits, but in spite of strenuous efforts he has not been able to acquire any information on the subject. Indeed none of the natives questioned had ever seen the young.

Incidentally it is mentioned that the depth of coloring and the darker markings about the hind quarters vary somewhat in different individuals, a fact which is confirmed by the examples received. I may further state that, in one or two of the more recent specimens, the lustre of the fur, especially about the belly and the rump, is so bright and so beautifully variable in tint, according to the incidence of light, as to invite the use of the term iridescent. The blacks also state that larger specimens than those found at Idracowra are met with further up the Finke watercourse.

I have received also a rough sketch of the tracks made by it in the sand, which conforms to the description already given.

In spite of the hopes, raised by this account of Mr. Bishop's successful management, that he would be able to bring this living specimen to Adelaide, we have been doomed to disappointment, for a letter received last month conveyed the disappointing news of its death. Having been uninterruptedly well during its captivity, it was found torpid and evidently ailing one morning after a heavy gale; it remained in this condition and died on the following day, after having endured a confinement lasting from the 15th June to 28th August, or a little over ten weeks. The animal seemed to maintain its condition throughout, and the only change in it observable was a decided increase in the length of the claws, which seemed to grow from disuse. This made its later movements more awkward than at first.

I may add, with regret, that Mr. Bishop anticipated that the prevailing dry weather would prevent his being able to repeat his experiment before the date of his leaving Idracowra, about the end of October. I must again express my indebtedness to him for so many interesting and very carefully recorded facts.

The following observations were made from a specimen, 12·75 cm. long, that had been preserved in glycerine and spirit. An incision had been made through the walls of the abdomen to allow

the entrance of the preservative fluid, but the viscera were not in a good condition for examination, either microscopic or macroscopic.

Female Organs of Reproduction.

Marsupium.—In my previous description of *Notoryctes* I reported that an examination of the specimens obtained on my transcontinental journey enabled me to establish the fact of the existence of a pouch in the female, thus confirming statements which had been made by my local informants, and verifying the somewhat uncertain conclusion to which the examination of the first imperfect specimen had led. A more careful investigation of the organ enables me now to supplement my previous remarks with additional particulars. As stated, the furthest anterior limit of the fundus of the pouch, which opens backwards, and readily admits a rod 5 mm. in diameter, is 15 mm. in front of the cloacal orifice, but its true depth, *i.e.*, the extent covered by the ventral wall, is 8 mm. Long sparse reddish hairs cover the greater part of the interior, with which are interspersed numerous grains of red sand, and from its mouth a shallow groove, as already mentioned, leads backwards to the cloacal aperture. The fundus is not, however, a simple rounded *cul-de-sac*, but extends laterally into two shallow bays or recesses, in each of which lies a bundle of stiff almost bristle-like hairs ; these were either lying completely loose, or were so feebly attached that they came away on the slightest touch of the forceps. On the dorsal wall of the pouch, at the entrance of each of these small bays or recesses, and 2 mm. from its blind extremity, is a very slightly elevated oval, or nearly circular, mammary prominence, having a diameter of from 1 mm. to 1·5 mm., its surface being devoid of hair. A distance of 2 mm. separates these two mammæ. They are so small as to be scarcely visible without a hand lens, and only come into view when the pouch is completely laid open. Rising from a slight depression in the centre of the prominence is an exceedingly minute nipple-like projection, which, however, scarcely reaches beyond the general level of the surface of the mamma. The arrangement may be likened to that of a circumvallate papilla, with a shallow sulcus, or to a retracted human nipple in extreme miniature.

A series of microscopic sections proves conclusively that the prominence is the outward expression of a mammary gland, and that the minute papillary projection is a nipple. Some of the sections which have passed through the latter, vertically to its exposed surface, show three or four nearly straight and parallel ducts of exit, while in the tissues below is evidence of the existence of glandular alveoli, milk-tubules and ducts. Many large empty hair follicles are also seen in the sections, in connection with

which are conspicuous sebaceous glands, but in no case was the hair itself *in situ*. I presume the long bristle-like hairs, mentioned above, belonged to these follicles, though I am unable to explain why they should have become loose (or wholly detached), while over the remaining surface of the pouch they should have remained firmly adherent.

Ovaries and Ligaments (Figs. 1, 2, and 3).—The ovaries (*ov*) are symmetrical, smooth, oval bodies, with the longer axis placed nearly longitudinally. Each lies in a well-marked pouch or recess constituted by the broad ligament (*ll*) which, sweeping across the pelvis, covers them loosely on their ventral, external, and partly on their posterior surfaces. Behind, the broad ligament passes to the neck and sides of the bladder, where it is lost; laterally, after covering the ventral surface of the oviducts, it extends to the sides and back of the pelvis, one prominent fold, which originates from the outer and hinder region of the ovary, constituting an ovario-pelvic ligament (Fig. 1, *op*). A longitudinal fold of peritoneum on each side, taking origin from the posterior parietes of the abdomen internal to the kidney, and partly also from the lower end of this organ, has its inner edge or margin slightly thickened to form an ovarian suspensory ligament (Fig. 1, *s.l*). On nearing the ovary its hinder end divides into two portions, one of which—the thicker and more distinct—is attached to the upper border of the ovary, and the other—more ventrally placed—to the oviduct near its commencement. Laterally and posteriorly this suspensory peritoneal fold is continuous with the pelvic inflection of the broad ligament as it passes from the ovaries to the sides and back of the pelvis. Springing from the peritoneum, which forms a loose investment for the rectum on its ventral and lateral surfaces, along a line so slightly oblique as to be almost median (Fig. 1, *a*), is a longitudinal fold or septum of peritoneum, having peculiar anterior connections *(b)* with a coil of intestine (*int*) not far from the pylorus, the exact extent and disposition of which requires further investigation. The ventral edge of this median longitudinal fold is attached to the posterior surface of the broad ligament in its middle line, as shown by the shaded line (*c*) in fig. 3, and, in fig. 1, by the faint streak which appears in the broad ligament as the downward continuation of the white line (*a*); this latter representing, as has been stated, the line of attachment to the rectal peritoneum. The disposition of the parts is somewhat similar to that which would obtain if, in a case of uterus bicornis in the human subject, the pouch of Douglas were longitudinally divided by a median septum passing from the peritoneum covering the rectum to the posterior (dorsal) surface of the broad ligament.

In connection with the posterior end of the ovary are a few attenuated, fringed or hydatiform appendages, apparently the remains of vestigial structures.

Oviducts (Figs. 1, 2 and 3, *od*).—The oviducts, sinuous in their anterior or distal segments, lie close to, and follow the contour of, the outer borders of the ovaries. Each apparently commences at a point internal to the anterior border of the ovary, but neither with hand-lens nor microscope could I detect the actual opening ; its tissues appeared to be merged insensibly into those of the broad ligament. About the level of the hinder border of the ovary the posterior segment of the oviduct dilates into what is evidently a uterine portion *(ut)*, with a smooth internal surface, but without any appreciable thickening of its parietes ; microscopic sections, however, reveal the presence of glandular tubules. These uterine portions of the oviducts converge almost transversely, and meet at a point corresponding to about the middle of the base of the bladder (Fig. 3). After meeting, though the two cavities appear externally to unite into a single tube, they really run for a little distance side by side, separated by a thin septum, and then join the urethra close to the exit from the bladder. The small size and softness of the parts, as well as an unfortunately misdirected incision, prevented my being certain of the exact manner of junction, whether, in fact, previously to joining the urethra, the two uteri do actually unite, or whether they open separately into the uro-genital canal. I did not feel justified, however, in mutilating another specimen for the establishment of this fact alone.

Ureters (Figs. 1, 2 and 3, *ur*).—These pierce the wall of the bladder, and open on its internal surface, distinctly within its cavity, but close to the urethral orifice.

Urogenital Canal (Figs. 2 and 3, *s.ug*).—This is a long, straight, and, relatively, narrow canal, lying, along its whole length, ventral and close to the rectum (Fig. 2, *r*), into which it opens very obliquely by a relatively wide and funnel-shaped orifice situated at a distance of 6 mm. from the anterior margin of the external cloacal aperture.

Clitoris.—Partially concealed in a small depression in the anterior wall of the cloaca, 2 mm. posterior to the entrance of the urogenital canal, and about 4 mm. from the anterior margin of the cloacal orifice is a small lingulate and single-pointed clitoris.

Cloaca (Fig 2, *cl*).—The cloaca, 6 mm. in length along its anterior, and 10 mm. along its posterior wall, has its internal surface irregularly rugose, and is apparently capable of considerable distension. Compared with those of the rectum and intestines its parietes are thick. On each side of the cloaca towards its anterior surface is a conspicuous oval gland, from which a

slender duct proceeding from its hinder end opens into the former by a minute papillary orifice.

Intestines.—The total length of intestine intervening between the pylorus and cloacal aperture is, when unravelled, 29 cm. Arranged in a few simple coils, and of relatively large calibre throughout, the anterior portion is of rather larger calibre than that of the posterior, having on an average a diameter of 5 cm. as against 3·5 cm. to which it diminishes at the point where it is shown as divided in fig. 1, *r*. It is slightly sacculated throughout, rather more so in the anterior than the posterior segment, but there is no marked external indication of a division between parts corresponding to large and small intestines; though, in the interior, an indistinctly marked valve-like projection, situated at a point about 10 cm. from the cloacal orifice, *may* indicate a delimitation; and a sacculation immediately succeeding this, rather more conspicuous than those elsewhere, may indicate a cæcum, but in both respects the observations are of very uncertain value. The mucous membrane throughout its whole length is soft and macerated, and is completely separated, forming an internal cast of the tube, which makes it impossible to distinguish the microscopical details.

Food.—The recognisable debris of the food is confined to the posterior portions of the intestine, the upper containing only granular or soft flocculent and disintegrated material. On examining the former they are found to consist of insect remains, amongst which is a small black ant almost entire. Our President, the Rev. Thomas Blackburn, has been good enough to examine the fragments submitted to him, and he informs me that they are portions of an orthopterous insect, probably those of a species of mole-cricket.

Stomach (Fig. 4).—This organ, which is evidently considerably compressed and contracted, measuring 1·75 cm. in its greatest length by 1·25 cm. in its widest part, is extremely simple in shape, the short segment of œsophagus which intervenes between it and the diaphragm springing from nearly the middle of the lesser curvature, so that about an equal length of the viscus lies on each side of it. It is empty, and the parietes are thick and muscular; the mucous membrane, less decomposed than in the intestines, being thrown into a few large longitudinal rugæ, which end at the pylorus. Externally the position of the pylorus is indicated by a circular constriction, to the intestinal side of which an outlying strip of the pancreas is closely adherent.

Pancreas.—The main mass of this organ lies in the usual situation, but it is too decomposed for accurate description or for determining the disposition of its duct.

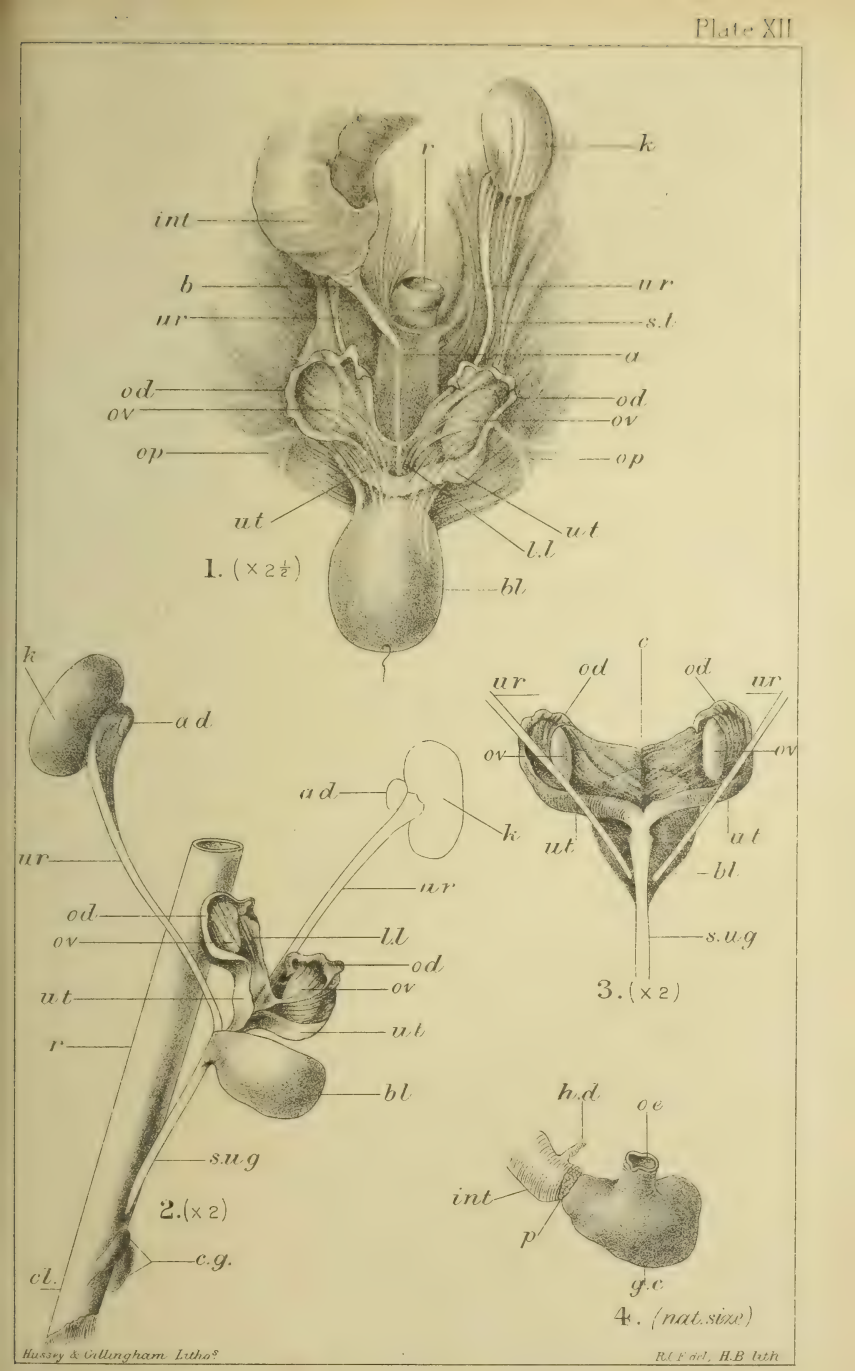
Liver.—As far as can be ascertained without removing the organ, and by reference to a damaged specimen from another animal, the liver consists of four distinct lobes, two large and two small, the former being ventral, and separated by a deep fissure. Of these, that on the left hand seems to correspond to the left lobe of the human liver, and the other to the lobus quadratus; of the smaller lobes, that which is dorsal, and on the left (but still to the right of the portal vein), probably corresponds to the lobus Spigelii. The other small one probably represents the human right lobe.

Apparently no gall-bladder exists, but the parts being rather decomposed in that region, I cannot be absolutely certain of this fact. There are, however, two hepatic ducts uniting into a considerable common bile-duct, which opens into the intestine 2·5 mm. from the pylorus.

Spleen.—This is an elongated flattened organ bent on the edge, so that its shape resembles that of the letter V with much expanded limbs.

Myology.—This is being worked out by Professor Wilson, of Sydney University, who will communicate his observations to this Society.

Conclusion.—It is necessary for me again to remark that I am but too well aware of many shortcomings in the above description, nor can I hope to have escaped errors of commission as well as of omission. Some points have been left obscure that undoubtedly might have been cleared up by reference to fresh material, but I was particularly anxious not to damage any more specimens than I could help. The number of them in my possession is still very limited, and I have been desirous in the interests of science both that some should be available for examination by more competent zoologists than myself, and that some other institutions more accessible to the scientific world should share the good fortune of the Adelaide Museum in possessing an example of an animal which is at the same time very difficult to obtain and of unusual zoological interest. I trust, however, that enough of its structure has now been made sufficiently clear to enable a correct conclusion to be formed, both as to its natural affinities and as to the manner in which this singular type—remarkable even in this land of curious and antique forms—should be classed. This discussion, however, must be left to a future occasion.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EXPLANATION OF PLATE XII.

Fig. 1. *Notoryctes typhlops.* Female organs of reproduction, with their ligaments *in situ*. The right kidney is obscured by a coil of intestine. *Ventral view* (x 2½); *ov*, ovary; *od*, oviduct; *ut*, its uterine portion—[the foregoing are represented as seen through the broad ligament (*ll*); for its disposition *vide* text]—*op*, ovario-pelvic fold of the broad ligament; *s.l*, suspensory ligament of ovary and oviduct; *k*, kidney; *ur*, ureter; *bl*, bladder, hooked backwards; *int*, coil of intestine; *r*, rectum; *a*, line of attachment of median fold or septum of peritoneum to that covering ventral surface of the rectum; *b*, peritoneal attachment to coil of intestine (*vide* text).

Fig. 2. *Notoryctes typhlops.* Female organs of reproduction. *Lateral view* partly diagrammatic (x 2); *ov*, ovary; *od*, oviduct; *ut*, uterus; *k*, kidney; *ad*, adrenal; *ur*, ureter; *bl*, bladder; *ll*, broad ligament; *s.ug*, uro-genital canal; *r*, rectum; *cl*, cloaca; *c.g*, cloacal gland.

Fig. 3. *Notoryctes typhlops.* Female organs of reproduction. *Dorsal view* (x 2); *ov*, ovary; *od*, oviduct; *ut*, uterus; *ur*, ureter; *sug*, urogenital canal; *ll*, broad ligament; *bl*, bladder—the fundus, indicated by a dotted outline, is seen through the broad ligament; *c*, line of attachment of median peritoneal fold or septum to the dorsal surface of the broad ligament (*vide* Fig. 1).

Fig. 4. *Notoryctes typhlops.* *Antero-ventral view; (nat. size); gc*, greater curvature; *œ*, œsophagus; *p*, pylorus, pointing also to adherent strip of pancreas; *int*, small intestine; *h.d*, common bile-duct.

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

[Read October 6, 1891.]

X.

STAPHYLINIDÆ.

SCOPÆUS.

S. dubius, Blackb. The habitat of this species is the Alpine regions of Victoria.

PSELAPHIDÆ.

EUPINES.

E. relicta, sp. nov. Mas. Glabra; nitida; supra lævis; obscure picea, pedibus antennisque dilutioribus; capite fere æquali; prothorace æquali leviter transverso, lateribus fortiter rotundatis pone medium subsinuatis; elytris prothorace dimidio longioribus, humeris callosis, striis suturalibus distinctis; antennis capiti prothoracique conjunctis longitudine æqualibus, modice clavatis; tibiis intermediis extus ante apicem late vix distincte emarginatis; metasterno late profunde excavato; abdominis segmento ventrali 2° in medio breviter transversim carinato. Long., $\frac{1}{2}$ l.

Of the antennæ joints 1 and 2 are somewhat equal *inter se*, both being longer and stouter than the following joints; 3 and 4 are subequal *inter se*, 5 stouter and longer (nearly equal to 2), 6-8 a little shorter than 3 and 4 but not transverse, 9 of the same length but stouter, gently transverse; 10 a little longer and much stouter (rather strongly transverse), 11 twice as long, stouter, and of a darker color.

Femina a mare differt metasterno minus profunde excavato, abdomine haud carinato.

The antennæ of the female differ from those of the male in the fifth joint being smaller, and the ninth not wider than the eighth.

In my tabulation of certain species of *Eupines* (*vide* supra, p. 86) the present species would fall beside *E. militaris*, from which it may be distinguished *inter alia* by its much less strongly clavate antennæ. From *E. Victoriæ*, King, which is very insufficiently described, but perhaps resembles it, it differs by its glabrous surface.

Victoria; taken by C. French, Esq., at Mordialloc, in flood refuse.

LAMELLICORNES.

MÆCHIDIUS.

M. pilosus, sp. nov. Piceo-brunneus; supra pilis elongatis erectis subtilibus sat dense, subtus setis squamiformibus albis et pilis brevibus erectis, vestitus; clypeo antice reflexo late fortiter triangulariter emarginato, ad latera late obtuse bidentato; prothorace transverso, lateribus serratis pone medium angulatis; elytris punctulato-striatis, interstitiis planis vix perspicue punctulatis; antennarum lamellis sat brevibus; unguiculis simplicibus; tibiis anticis sat fortiter tridentatis. Long., 4 l.; lat., $2\frac{1}{5}$ l.

Very distinct from nearly all its previously described congeners by the long, soft, erect hair clothing its upper surface. From *M. bidentulus*, Fairm., it would seem to differ by the strongly serrulate lateral margins of its prothorax; from *M. variolosus*, Macl., by its more strongly emarginate clypeus and its strongly tridentate front tibiæ.

W. Australia; Yilgarn; sent to me by C. French, Esq.

BUPRESTIDÆ.

BUBASTES.

B. occidentalis, sp. nov. Cylindrica; nitida; læte viridis, subaureo-micans, antennis tibiis tarsisque obscuris, corpore subtus pilis squamiformibus brevibus pallide ochraceis sat dense vestito; capite inter oculos sat concavo, fortiter sat crebre punctulato; prothorace quam longiori circiter tertia parte latiori, sat crebre (ad latera transversim rugulose) punctulato; elytris minus fortiter sat crebre sat rugulose punctulatis, manifeste striatis, apice emarginatis et bispinosis. Long., 7 l.; lat., $2\frac{1}{5}$ l.

A bright green species with a somewhat golden tone; compared with *B. inconsistans*, Thoms., and *laticollis*, Blackb., the disc of the prothorax is very much less closely punctured; *B. globicollis*, Thoms., seems to be punctured like *inconsistans*, and to have the sides of the prothorax strongly rounded (in this species they are as in *inconsistans*); *B. sphenoida*, L. & G., is described as having its entire surface evenly punctured (in this species the prothorax is very much more coarsely punctulate than the elytra); the puncturation of *B. cylindricus*, Macl. (from N.W. Australia), is not characterised, but totally different coloring and locality render identity most improbable. *B. splendens*, Blackb., comes near this insect, but is of considerably narrower form, with the

puncturation of the head and the disc of the prothorax considerably sparser, the color more brilliant, &c.

W. Australia; in the collection of C. French, Esq.

B. laticollis, Blackb. I believe this to be identical with *B. globicollis*, Thoms., of which it must become a synonym if I am right in this belief. As I have before remarked, M. Thomson's Appendix to his Typ. Bupr. (in which this and other Australian *Buprestidæ* are described) escaped notice in the *Zoological Record* until some years after its publication, and (owing, I presume, to that omission) was not noticed in Mr. Masters' Catalogue; and so, unfortunately, I was not aware of the existence of the Appendix when I described *B. laticollis*.

B. splendens, sp. nov. Cylindrica; angusta; pernitida; splendide viridis, capite postice antennis que violaceis, corpore subtus pilis brevibus squamiformibus albidis vestito; capite inter oculos sat concavo, fortiter (antice sparsius postice confertim) punctulato; prothorace quam longiori quarta parte latiori, fortiter (disco sparsius lateribus his transversim rugulosis parteque antica sat crebre) punctulato, lateribus fere rectis; elytris sat fortiter sat crebre sat rugulose punctulatis, manifeste striatis, apice emarginatis et bispinosis. Long., 7 l.; lat., 2 l.

An insect of extremely brilliant coloring. Compared with *B. inconsistans*, Thoms., the prothorax is very much more sparsely punctured, and is not rugulose on the disc, while the elytra are less finely punctured, and more distinctly striated.

Central Australia; MacDonnell Ranges; in the collection of C. French, Esq.

MELOBASIS.

M. pulchra, sp. nov. Oblongo-ovalis; læte viridis, prothoracis vittis latis 2 et elytrorum notis intricatis purpureis; capite plano fortiter confertim punctulato; prothorace quam longiori plus quam dimidio (postice quam antice circiter quinta parte) latiori, in disco sat sparsim (ad latera confertim rugulose) fortiter punctulato, lateribus antice sat fortiter rotundatis postice fere parallelis; elytris confuse inæqualiter punctulatis, interrupte striatis, interstitiis hic illic leviter convexis, lateribus apicem versus denticulatis. Long., $4\frac{1}{2}$ l.; lat., $1\frac{3}{5}$ l.

The markings on the elytra are very complicated and difficult to describe clearly; their pattern is most readily characterised if the purple markings be regarded as the ground color; then the green is seen to form (*a*) a wide common sutural vitta from the scutellum more than a quarter of the length of the elytra, (*b*) a somewhat similar but slightly longer vitta on each elytron com-

mencing about the middle of the base and sloping a little towards the suture, (*c*) a fascia-like mark about the middle of the disc not nearly reaching either the suture or the lateral margin and produced a little towards the base of the elytra at its external end (thus forming marks like L I), (*d*) an oval obliquely placed spot about intermediate between the middle and the apex. The markings are extremely like those of some forms of *M. intricata*, Blackb., but that species has the prothorax very much less coarsely punctured and narrowed (with only slightly arcuate sides) from quite near the base to the apex. *M. fulgurans*, Thoms. (from Tasmania), is also very similarly marked and colored; it is, however, considerably larger (long. 6 l.), and is described as having the prothoracic vittæ black and the prothorax "regulariter punctatus:" M. Thomson's description is too brief to indicate whether the pattern of the elytra bears more than a *general* resemblance to that of the present species.

The sculpture of the head and prothorax is almost exactly as in *M. verna*, Hope, but the sides of the prothorax are much more strongly rounded than in that species.

Central Australia; MacDonnell Ranges; in the collection of C. French, Esq.

M. bicolor, sp. nov. Læte viridis, capite prothoraceque cupreotinctis, elytris totis igneo-cupreis; subtus pilis brevibus sparsis vestita; capite plano confertim fortiter punctulato; prothorace quam longiori dimidio (postice quam antice vix manifeste) latiori, sat fortiter sat crebre punctulato, obsolete (ad latera magis distincte) transversim rugato, lateribus vix arcuatis; scutello minuto; elytris leviter sat crebre parum æqualiter punctulatis, sat distincte 3-costatis, lateribus postice (fere a medio) denticulatis. Long., $5\frac{3}{5}$ l.; lat., 2 l.

A conspicuous species on account of its bright fiery-copper-colored elytra. It resembles *M. nervosa*, Boisd., compared with which (apart from color) the head is smaller and less pubescent, the prothorax is a little less strongly punctured, and has less rounded sides, the elytra are not quite so strongly costate, the scutellum is smaller, the underside is much less strongly punctured, and the prosternum is declivous in front, with its anterior margin much less thickened. *M. Saundersi*, Masters, is very distinct by the apical spine of its elytra, and *M. costifera*, Thoms. (which must be very close to *Saundersi*) by the same character; *M. rubromarginata*, Saund. (from N.W. Australia), is very differently colored, and has four costæ on each elytron; *M. læta*, Saund., has the sides of the prothorax rounded, &c.; *M. Lathami*, Hope, has *inter alia* a very differently-shaped prothorax.

W. Australia; in the collection of C. French, Esq.

A. subcostata, sp. nov. Sat lata; sat nitida; cupreo-nigra, hic illic obscure cæruleo-micans; capite postice æqualiter convexo, striolato-alveolato; prothorace tumido (fere gibboso) quam longiori minus quam duplo latiori, ut caput sculpturato, postice quam antice sat latiori, lateribus fortiter rotundatis; elytris longitudinaliter leviter distincte 4-costatis, apicem lateraque versus sat crebre subfortiter granulosis (partibus ceteris obscure squamoso-punctulatis) lateribus postice distincte denticulatis; corpore subtus antice crasse leviter squamoso-punctulato, abdomine longitudinaliter carinulis subtilibus insigni. Long., 3l.; lat., $1\frac{1}{5}$l.

The prothorax is fully as wide as the elytra (to the eye rather wider). The conspicuous (in some lights) blue patches on both upper and under surface, together with the perfectly distinct costæ of the elytra and the ventral segments sculptured with very fine (but not at all close) longitudinal elevated lines, render this a conspicuous species. The prothorax is much less transverse than in *A. Adelaidæ*, Hope; the ventral sculpture resembles that of *A. planifrons*, Blackb.

S.A.; in the South Australian Museum.

A. soror, sp. nov. Sat lata; subopaca; nigra vix ænescens; capite linea longitudinali subtili impresso, sat crebre punctulato, puncturis umbilicatis; prothorace modice convexo quam longiori fere duplo latiori, crebre transversim striolato-alveolato, leviter canaliculato, postice quam antice sat latiori, lateribus sat fortiter rotundatis; elytris subtiliter granulatis, lateribus postice distincte denticulatis; corpore subtus leviter subcrasse alveolato-reticulato, segmento ventrali apicali longitudinaliter carinulis subtilibus insigni. Long., $3\frac{1}{5}$l.; lat., $1\frac{1}{5}$l.

Differs from the preceding *inter alia* by the complete absence of elytral costæ; it is much larger than any others of the previously described species.

N. Queensland; in the collection of C. French, Esq.

A. angusta, sp. nov. Parallela; minus lata; minus depressa; sat nitida; ænea; capite leviter striolato-alveolato, fronte sat late impressa, parte impressa in medio longitudinaliter convexa; prothorace sat convexo, quam longiori fere duplo latiori, postice quam antice haud latiori, in disco subobsolete latera versus distincte striolato-alveolato, margine antico perspicue bisinuato, lateribus leviter arcuatis; elytris manifeste transversim rugulosis obscure punctulatis, lateribus postice indistincte crenulatis; corpore subtus leviter sat crasse striolato-alveolato. Long., $2\frac{1}{5}$l.; lat., $\frac{4}{5}$l. (vix).

Distinguished from the other described species of the genus by its more elongate and parallel form, and its prothorax as wide in front as at the base; also by the impression on the head, which is divided by an obscure longitudinal convexity down the middle; the hinder ventral segments are almost lævigate, and none of the ventral segments are longitudinally sculptured.

This species is, perhaps, near *A. Deyrollei*, Thoms., which, however, is (according to the measurements given) half as wide as long, and is a much smaller insect. M. Thomson's description is quite insufficient for certain identification.

Victoria; in the collection of C. French, Esq.

A. læta, sp. nov. Brevis; lata; modice convexa; sat nitida; obscure ænea, hic illic obscure aureo-vel cyaneo-tincta, elytris sat læte cupreo-purpureis; capite æquali convexo, leviter sat crasse striolato-alveolato; prothorace quam longiori vix duplo latiori, in disco vix distincte ad latera sat fortiter striolato-alveolato, antice sat angustato, lateribus modice rotundatis; elytris sat inæqualibus, distincte subtiliter granulatis, lateribus postice vix perspicue crenulatis; corpore subtus obscure (prosterni lateribus sat crasse sat fortiter) striolato-alveolato, segmentis ventralibus (apicali excepto) longitudinaliter carinulis validis insignibus. Long., $1\frac{1}{2}$ l.; lat., $\frac{3}{4}$ l. (vix).

A wide, short species, more brightly colored than is usual in the genus, and well distinguished by the strong longitudinal carinulæ of its ventral segments (except the last). It is near *A. Adelaidæ*, Hope, and *planifrons*, Blackb., but is distinguished from both, in addition to the characters just mentioned, by its somewhat less transverse prothorax, the sides of which are much less strongly rounded.

S. Australia; Lake Eyre basin.

CISSEIS.

C. dispar, sp. nov. Minus nitida; supra vix pubescens; prasina hic illic obscure subaureo tincta, vel tota sordide aureo-olivacea; capite subtilius minus crebre punctulato, antice late leviter concavo postice subtiliter carinato; prothorace quam longiori fere duplo (postice quam antice parum) latiori, concentrice subtilius striolato, medio antrorsum sat fortiter producto; scutello plus minus distincte transversim striolato; elytris sat æqualiter crebre subtilius leviter punctulatis, plus minus transversim rugatis, lateribus postice subtiliter vel vix distincte denticulatis; corpore subtus sparsim (abdomine ad latera magis crebre) pubescenti. Long., 3 l.; lat., $1\frac{1}{5}$ l.

The color is a dull grass-green, tinged in places with a dead brassy-copper tone, which is liable to overspread the whole upper

surface; the underside is more nitid, and usually darker in color than the upper surface. The puncturation of the head is almost as in *C. roseocuprea*, Hope (more consisting of isolated punctures, and less tending to a striolated appearance than in most of its congeners); the shape and sculpture of the prothorax are nearly as in *C. æneicollis*, Hope (but without pubescent spots); the sculpture of the elytra has a slightly asperate appearance, being reticulately and minutely strigose, with the interstices of the strigæ somewhat resembling flattened granules, or it can be regarded as consisting of punctures surrounded with elevated margins. It is not very different from the elytral sculpture of *C. æneicollis*, Hope, but appears distinctly more asperate. The short longitudinal, carina-like, fine line on the summit of the head is characteristic. Probably this species is near *C. subcarinifrons*, Thoms., but the description of that species states that its prothorax is not transverse.

Victoria; sent to me by C. French, Esq.

C. bella, sp. nov. Sat angustata; nitida; aureo-ænea, elytris subpurpurascentibus, his et metasterni coxarum posticarum abdominisque lateribus maculis albis pubescentibus ornatis; capite antice longitudinaliter late sulcato, fortiter minus crebre punctulato et indistincte confuse strigato; prothorace quam longiori dimidio (postice quam antice parum) latiori, sparsim sat fortiter punctulato et subconcentrice minus crebre sat fortiter strigato, versus angulos posticos sat depresso, lateribus leviter arcuatis; scutello punctis nonnullis magnis notato; elytris minus confertim reticulato-striolatis, interspatiis subgranulosis, lateribus postice crenulatis. Long., 3 l.; lat., 1 l.

A brilliantly nitid species (especially the head and prothorax), with the head more coarsely punctured than in most of its congeners; it is perhaps near *C. cupreicollis*, Hope, but differs *inter alia* by its prothorax entirely devoid of pubescent spots. The pubescent spots on the elytra are arranged very much as in *C. æneicollis*, Hope, there being one on the shoulder, one near the lateral margin about the middle, one half way between the last-named and the apex, and one on the suture a little in front of the apex, the two nearest to the apex appearing to form an interrupted fascia. The elytra of *C. æneicollis* bear some additional smaller pubescent spots, which are wanting in this species (I do not think the example before me is at all abraded). Compared with *C. æneicollis* the present insect is of much narrower and more elongate form, with the puncturation of the head much less close, the prothorax very evidently less transverse, and the elytral sculpture (though of similar kind) markedly less close.

Victoria; in the collection of C. French, Esq.

C. pygmæa, sp. nov. Sat angusta; minus nitida; ænea vel nigro-ænea, hic illic vix cyanco-micans; pube albida maculatim ornata; capite late longitudinaliter concavo, sparsius vix fortius punctulato; prothorace quam longiori fere duabus partibus (postice quam antice haud multo) latiori, subtilius subconcentrice striolato, lateribus sat rotundatis, basi valde bisinuata; scutello opaco vix perspicue striolato; elytris crebre subtilius reticulato-striolatis, interspatiis vix distincte granuliformibus, lateribus postice denticulatis. Long., 2 l. (vix); lat., $\frac{7}{10}$ l.

The silvery-white pattern is not formed by pubescent impressions, but by coarse scale-like hairs, more or less sprinkled over the whole surface, but condensed into a large spot on the hinder part of the disc of the prothorax on either side, a large ill-defined spot on the base of the elytra, two wide ill-defined fasciæ on the elytra (one at the middle, the other near the apex, the latter somewhat dilated hindward on the suture and a little curved outwards close to the apex), and some spots on the sides of the ventral segments. I do not think this species is much like any of the very small species of *Cisseis* that have been described previously.

Victoria; in the collection of C. French, Esq.

C. verna, sp. nov. Sat angusta; sat nitida; viridis, hic illic cærulco-micans; capite planato medio longitudinaliter sat subtiliter impresso, subopaco, coriaceo, sparsim minus fortiter punctulato; prothorace quam longiori duabus partibus (postice quam antice vix manifeste) latiori, vix distincte punctulato, in disco subtiliter (latera versus fortiter) transversim subconcentrice striolato, lateribus leviter arcuatis; scutello punctulato-striolato; elytris leviter sat crebre reticulato-punctulatis, lateribus postice subtiliter denticulatis. Long., $2\frac{1}{3}$ l.; lat., $\frac{4}{5}$ l.

There is a little very inconspicuous whitish pubescence on the elytra, where, however, it does not form a distinct pattern. The parts where the general bright green colour changes most distinctly to cyaneous are the apices of the elytra and the undersurface (the legs, however, being green). The sides of the metasternum and of the ventral segments are more or less pubescent. The prothoracic sculpture consists of transversely arched (scarcely concentric) striolæ, which are mere fine scratches in the middle, but deepen into strong wrinkles towards the sides. The surface of the prothorax is much depressed in the neighbourhood of the hind angles. In some lights the anterior part of the suture shows a distinctly golden tone of colour. The sculpture of the elytra is of the kind usual in allied species of *Cisseis* (*e.g.*,

much like that of *C. æneipennis*, Hope, but perhaps a little less close).

This species is no doubt near *C. uniformis*, Thoms., and *minutissima*, Thoms., the former of which, however, is said to have the prothorax not transverse, the scutellum lævigate, &c.; while the latter is said to be of the form of an *Anthaxia* (which the present insect certainly is not), and also to have the prothorax "punctate-rugose."

Victoria.

C. perplexa, sp. nov. Sat elongata; convexa; sat nitida; nigricans, cupreo-micans (præsertim subtus), corpore subtus prothoracis lateribus capiteque sparsim argenteo-pilosis; capite fere æquali, antice leviter impresso, confuse sat fortiter vix crebre punctulato; prothorace quam longiori dimidio (postice quam antice vix perspicue) latiori, concentrice minus fortiter striolato, lateribus per carinæ intramarginalis intercessionem vix æqualibus, hac fortiter arcuata marginem anticum ad angulum lateralem vix attingenti; scutello subcoriaceo vix perspicue punctulato; elytris inæqualiter sat crasse rugulosis, antice et ad latera fortiter transversim rugatis, lateribus postice denticulatis. Long., 4 l.; lat., $1\frac{2}{5}$ l.

This species belongs to a small group of *Cisseis* (of which *C. Lindi*, mihi, may perhaps be considered the type distinguished by the extreme feebleness of the tooth on the claws, and also by the peculiar form of the intra-marginal carina of the prothorax, which is strongly arched, and touches (or nearly so) the true lateral margin, both at the base and apex instead of ending anteriorly (as in most species of *Cisseis*) on or close to the anterior margin considerably within its lateral extremity, and which consequently more or less crosses the outline (as seen from above) of the true lateral margin and makes the sides of the prothorax, as viewed from above, seem more or less uneven. All these species (as yet known to me) are entirely devoid of markings formed by pubescence, and are found in Western and South-Western Australia.

The present species is distinguished from the others of the group (independently of its more uniform and obscure coloring) by the much coarser sculpture of its elytra. This is of the same character as in most species of *Cisseis* (much as described above in *C. dispar*), but the interspaces of the wrinkles are unusually large, in front and towards the side being strongly transverse, and in parts of the disc appearing almost like irregular pustules.

Australia; I am not sure of the exact locality, but I have no doubt it is Western.

DISCODERES.

D. torridus, sp. nov. Læte æneus, corpore subtus antice femoribusque cyaneis; pilis densis albis nigrisque maculatim dispositis vestitus; capite prothoraceque valde inæqualibus, striolato-alveolatis; scutello magno elongato triangulari; elytris singulis costam discoidalem ferentibus, acervatim punctulatis et in partibus nonnullis transversim rugulosis, lateribus postice crenulatis; tibiis posticis extus ad apicem dentiformibus. Long., 5 l.; lat., 2 l.

The sculpture of the upper surface is to a great extent concealed by dense pubescence, forming a pattern of marbled appearance; this pubescence takes the form of a transverse white fascia between the eyes, a dense white mass on each side of the prothorax, a number of smaller white spots on the elytra (some of which range themselves into two fasciæ behind the middle), some large black spots mostly in the hinder half of the elytra, a lateral white spot on the hind coxæ, a dense white mass on either side of the basal two ventral segments and some smaller white spots on the other ventral segments. The crown of the head bears two rounded and moderately conspicuous gibbosities; the prothorax is widely elevated down the middle line, the elevated portion bearing a ridge-like tubercle on either side in its hinder half; the elytra are much flattened (or almost concave, between the suture and the discoidal ridge. The sculpture of the prothorax is arranged in concentric lines. The carina within the border of the prothorax on either side is elongate and sinuous.

N. Queensland; in the collection of C. French, Esq.

CORÆBUS.

C. pilosicollis, sp. nov. Latus; æneus hic illic cyaneo-micans; prothorace utrinque et segmentis ventralibus (apicalibus 2 exceptis) dense (elytris obscure maculatim) albo-pubescentibus; capite valde inæquali, fortiter punctulato et certo adspectu longitudinaliter strigoso; prothorace in medio longitudinaliter gibboso, antice fortiter declivi, postice utrinque transversim profunde concavo, concentrice sat crasse striolato, intra marginem utrinque postice carina brevi instructo; scutello fortiter transverso, postice acuminato, ut prothorax striolato; elytris sat fortiter sat rugulose sat crebre punctulatis. Long., 6 l.; lat., $2\frac{1}{2}$ l.

The arrangement of the pubescence is very distinctive; the pubescence is thin and little noticeable except on the sides of the prothorax and the whole abdomen (except the apical two segments), which are densely clothed with tolerably long silvery-white soft hairs. The chief inequalities on the head are a strong sulcus down the middle, a large transverse excavation between

the eyes and a strong carina on either side bordering the eyes within.

I refer this insect to *Corœbus* a little doubtfully, as its facies is hardly of that genus; the short basal joint of the tarsi, transverse scutellum abruptly pointed behind, and short lateral carina of the prothorax seem, however, to place it there.

N. Queensland; in the collection of C. French, Esq.

AGRILUS.

A. Frenchi, sp. nov. Obscure viridis; pube tenui argentea minus crebre vestitus, vitta humerali et fascia postmediana denudatis; prothorace vix transverso, antice quam postice latiori, subtiliter transversim striolato, in medio longitudinaliter sulcato, postice utrinque impresso; scutello subcoriaceo, elytris sat crebre subrugulosis, apice emarginatis et spinis validis binis armatis. Long., $2\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

Extremely distinct from the previously-described Australian *Agrili*, especially by the strongly bispinose apices of the elytra.

Victoria; in the collection of C. French, Esq.

PARACEPHALA.

P. ænea, sp. nov. Elongata; subcylindrica; sat nitida; ænea; pilis argenteis minus sparsim vestita; capite longitudinaliter canaliculato, quam prothorax magis nitido, sat fortiter sat crebre punctulato; prothorace elytrisque sat æqualiter confertim granuloso-punctulatis; illo fortiter transverso, disco medio subgibboso, parte gibbosa transversim subcarinata; elytris postice rotundatis denticulatis; corpore subtus latera versus sat dense argenteo-pilosis. Long., 3—$3\frac{1}{2}$ l.; lat., $\frac{4}{5}$ l.—1 l.

The peculiar form of the prothorax will render this species easily recognisable. The prothorax is scarcely marked off by a distinct line from the flanks of the prosternum. The present insect does not seem to differ structurally from *Paracephala (Agrilus) pistacina*, Hope, though it is very much larger, and its form is distinctly less narrow and cylindric; it is very similar in general facies to the species which I take to be *P. murina*, Thoms.

N. W. Australia.

CLERIDÆ.

ALLELIDEA.

The species described below is evidently a member of this genus. The basal joint of the tarsi being quite exposed when viewed from above would seem to place the genus near *Tillus*.

A. viridis, sp. nov. Cylindrica; linearis; nitida; pilis erectis sparsis vestita; viridi-ænea, antennis (clava excepta) palpis pedibusque (tibiis plus minusve infuscatis exceptis) flavis vel

rufis, elytrorum lateribus postice albidis; capite crebre, prothorace sparsim, elytris subseriatim, fortiter punctulatis; Long., 2—2½ l.; lat., ⅔ l.

The insect is at its narrowest where the prothorax meets the elytra; the head, the middle of the prothorax, and the elytra close to the apex are about equal in width, and are the widest parts of the body. The prothorax is much longer than wide, and is narrow in the basal and apical parts being strongly and roundly dilated at, or slightly in front of, the middle. The elytra are considerably shorter than the hind body in the larger examples (which I take to be females), in a smaller one (probably a male) they are slightly longer than the hind body. The whitish color on the elytra is confined to the hinder part of the lateral margin in some examples, in others it covers the apex.

Victoria; taken by C. French, Esq., in flood refuse at Mordialloc.

CORMODES.

C. constricta, Blackb. This species described by me (Tr. Roy. Soc., S.A., 1890, p. 124) as a *Natalis* must be placed in *Cormodes* which Mr. Pascoe (Journ. of Ent., I., p. 46) characterises as closely allied to *Natalis*, but differing in the absence of wings, and in the elytra having no defined humeral angle. The wings of *C. constricta* are not quite wanting, but they are so rudimentary as to be useless for flight.

TARSOSTENUS.

T. univittatus, Rossi. I do not think that this cosmopolitan insect has hitherto been recorded as Australian. I have found it near Adelaide.

ZENITHICOLA.

Z. sosius, Chevr. The habitat of this species is given as "Australia." I have an example in my collection ticketed "South Australia."

Z. (*Clerus*) *crassus*, Newm. This species is certainly a *Zenithicola*; and equally certainly, I think, *Z.* (*Clerus*) *obesus*, White, is identical, so that the latter name must sink into a synonym.

TROGODENDRON.

T. (*Notoxus*) *ephippium*, Boisd. I do not think there is the least doubt that Boisduval's *Notoxus ephippium* is a *Trogodendron*, and I take it to be equally certain that *Notoxus ephippiger*, White, is the same thing. Although the examples for which the two names were proposed do not appear to have been even different varieties, the species appears to be a variable one, as I have seen examples with markings as specified in the descriptions, and others that I take to be certainly not

distinct specifically, in which the yellow spot on the suture is very indistinct or even quite wanting. M. Chevrolat, in his Catalogue of the *Clerida*, places *N. ephippiger*, White, in *Opilus*; but I feel confident this is a mistake, as the finely-granulated eyes of specimens before me (which agree exactly with Boisduval's unusually full description, and also with White's) are quite inconsistent with a place in that genus. M. Chevrolat does not seem to have noticed the almost literal identity of White's and Boisduval's descriptions; indeed, I cannot find that he has referred to the latter at all.

THANASIMOMORPHA (*gen. nov.*).

Thanasimo affinis; differt palporum maxillarium articulo ultimo securiformi.

The Rev. H. S. Gorham (Cist. Ent., II., p. 62) points out the necessity of a new name for *Tillus bipartitus*, Blanch., but without proposing one. I therefore suggest the above name. Another member of the genus (as Mr. Gorham points out) is *Clerus guttulus*, White.

T. intricata, sp. nov. Nigro-picea vix violacea-micans, antennis palpisque obscure rufo-piceis, elytrorum tertia parte basali maculaque suturali postmediana metasterno femoribus ad basin tibiis anterioribus 4 (subtus) et tibiis posticis (totis) rufis, elytrorum fascia mediana (suturam vix attingenti) eburnea; capillis erectis vestita, ex his nonnullis albidis (in elytrorum pone medium partibus dilutioribus condensatis) nonnullis nigris; capite prothoraceque crebre profunde rugulose punctulatis, hoc quam longiori vix latiori, latitudine majori pone medium posita, lateribus sat rotundatis basin versus vix sinuatis; elytris basi utrinque gibbosis, antice crasse profunde postice vix manifeste, punctulatis. Long., $2\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

Resembles *T. bipartita*, Blanch., but with the femora (except at base) and antennæ almost black, and a large red spot on the suture of the elytra behind the white fascia, and with the prothorax less rounded on the sides, and a little less closely rugulose.

W. Australia; taken by E. Meyrick, Esq.

METABASIS.

M. variegata, sp. nov. Fusco-nigra, pilis albis fuscisque vestita, ore palpis antennis prothorace elytrorum parte (fere dimidia) basali pedibusque rufis, elytrorum fascia media leviter arcuata et striga suturali apicali flavis; capite crasse confertim prothorace elytrisque crassissime minus confertim, punctulatis; prothorace fortiter transverso, late longitudinaliter sulcato, sulci lateribus antice subcariniformibus;

elytrorum sculptura apicem versus paullo minus crassa. Long., 2 l.; lat., $\frac{4}{5}$ l. (vix).

Var. ? Prothorace elytrisque (notis flavis exceptis) totis fusco-nigris.

In the typical form the red and blackish portions of the elytra are separated from each other by the yellow median fascia except close to the lateral margin, where the blackish color is to be traced to some extent in front of the fascia. Differs from *M. accincta*, Newm. (apart from colour and size) by the median fascia of the elytra being gently arched all across (instead of straight)—its convex side forward—by the apical yellow of the suture extending considerably further forward, by the prothorax being evidently more transverse with a wide well-defined convexity down the middle, the external boundary of which is in front, distinctly subcariniform on either side, and by the punctuation of the whole upper surface being very evidently coarser and less close. In the dark var. there is no trace of pale coloring along the basal margin of the elytra.

S. Australia; under bark of Eucalyptus in the Tumby Scrub, near Port Lincoln.

PARAPYLUS (gen. nov.).

I propose this name for the insect which Mr. Newman described as *Pylus bicinctus*, and which subsequently was called *Necrobia pinguis*, White. The Rev. H. S. Gorham (Trans. Ent. Soc., 1878) has already discussed the characters of this type, and pointed out the need of a new generic name for it, but without proposing one.

CROBENIA (gen. nov.).

Necrobiæ affinis, sed oculis subtiliter granulatis, antennarum clava elongata laxe articulata.

This genus resembles *Necrobia* in its four-jointed tarsi with the basal joint covered by the second, in its laterally margined prothorax, and in the structure of its palpi, but the eyes are finely granulated and the antennal club is elongate, and consists of three joints, none of which is decidedly transverse. It is distinguished from *Paratillus*, *inter alia*, by its much less elongate form and different antennal club, from *Pylus* and *Parapylus* by the structure of its tarsi. The name I have used is an anagram of *Necrobia*.

C. Eyrensis, sp. nov. Sat nitida; sparsim albo-hirta; cyaneo-nigra, antennarum articulo basali prothorace et pedibus rufis; capite confertim sat crasse prothorace elytrisque crassissime minus confertim punctulatis. Long., 2 l.; lat., $\frac{4}{5}$ l.

The prothorax is nearly half again as wide as long and is nearly evenly and rather strongly rounded laterally, but is at its widest slightly behind the middle; its lateral edges are finely but not very closely crenulate.

S. Australia; Basin of Lake Eyre.

PYLUS.

P. pygmæus, sp. nov. Testaceo-brunneus, elytris piceo-notatis; sparsim breviter pilosus; capite prothoraceque sat crasse nec crebre punctulatis; hoc vix transverso, medio longitudinaliter late nec profunde concavo, lateribus pone medium leviter rotundatim dilatatis; elytris striato-punctulatis prope apicem sculptura obsoletescenti. Long., $1\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

The piceous markings on the elytra are not very clearly defined. They consist of a fascia slightly in front of the middle which is tolerably wide close to the lateral margin and narrows towards (but scarcely reaches) the suture, and another somewhat similar but much wider fascia slightly behind the middle and extending nearly to the apex; this hinder fascia is less narrowed than the anterior one towards the suture.

The coarsely-granulated eyes, laterally margined prothorax, and antennal and tarsal structure associate this very small *Clerid* with *Pylus fatuus*, Newm.

S. Australia; near Port Lincoln, in stems of *Xanthorrhœa*.

LYMEXYLONIDÆ.

ATRACTOCERUS.

A. Victoriensis, sp. nov. Ater; nitidus (capite elytrisque exceptis); capite creberrime ruguloso; prothorace quam latiori vix longiori, canaliculato, subquadrato, retrorsum leviter angustato, crebre sat fortiter punctulato; elytris crebre subtiliter aspere punctulato; abdomine supra a basi retrorsum gradatim minus perspicue punctulato, subtus fere lævi. Long., $8\frac{1}{4}$ l.

The previously-described Australian species of this genus (*A. Kreusleræ*, Pasc.) is a much larger insect (long., 12 l.), and is of a ferruginous colour; as the specific characters mentioned in the description are almost limited to colour, it is not possible (without seeing the type) to distinguish this species from it otherwise than by saying that it is much smaller and entirely black.

Victoria; in the collection of C. French, Esq.

PTINIDÆ.

ANOBIUM.

A. paniceum, Lin. I do not think this species has been hitherto recorded as Australian; it is, however, common and widely distributed, no doubt introduced.

A. domesticum. This also occurs in Australia; I have found it near Port Lincoln; as far as I know its occurrence has not been previously recorded.

DRYOPHILODES (gen. nov.).

Dryophilo affinis sed antennis aliter articulatis, articulo 2° quam 3^us^ minori, articulis apicalibus præcedentibus haud dissimilibus.

The species for which I propose this name resemble *Dryophilus*, but their antennæ with the second joint small and no marked distinction between the apical joints and those preceding them seem inconsistent with a place in that genus.

D. insignis, sp. nov. Sat elongatus; sat parallelus; niger, vix rufescens, pube ochraceo-cinerea dense vestitus; prothorace maculis parvis 3 (transversim positis), elytris macula magna communi ovali denudata ornatis; hac pube alba circumcincta; scutello dense albo-piloso; prothorace sat convexo, inæquali vix transverso, antice fortiter rotundato-producto, lateribus bisinuatis, angulis posticis acute rectis deplanatis, basi media late lobata; antennis quam corporis dimidium longioribus. Long., $1\frac{4}{5}$ l.; lat., $\frac{3}{4}$ l.

The sculpture is entirely buried under close pubescence, except on the denuded spots, where it appears that the prothorax is closely and asperately punctulate, and that the elytra are coriaceous rather than distinctly punctured. The large common oval spot occupying about the middle third part (both of length and breadth) of the elytra, with its conspicuous edging of white pubescence, renders this a most conspicuous species. The basal joint of the antenna is about as long as the next two together; 2 is slightly shorter than 3; 3-5 increase slightly in length; 6 is equal to 5; 7-10 are slightly longer, and equal *inter se;* 11 is slightly longer than 10; joints 4-10 are feebly triangular, and each joint being inserted slightly outside the middle point of the truncate apex of the preceding joint, the antennæ have a slightly serrated appearance.

Victoria; Alpine district.

D. australis, sp. nov. Minus elongatus; sat parallelus; piceus, antennis capite prothoracis marginibus abdomine pedibus et sutura postice rufescentibus; pube brunnea minus perspicue vestitus, scutello dense albido-hirto; capite prothoraceque confertim subtiliter subaspere punctulatis; hoc vix inæquali fortiter transverso antice modice rotundato-producto, lateribus fortiter rotundatis ante basin sinuatis, angulis posticis rectis, basi media late lobata; elytris crebre obscure punctulatis, obsoletissime striatis; antennis quam corporis dimidium vix longioribus. Long., $1\frac{2}{5}$ l.; lat., $\frac{3}{5}$ l.

The antennæ are a little shorter than in the preceding species, but their structure and the proportional lengths of the joints *inter se* are not different.

Victoria; Alpine district.

CISSIDÆ.

CIS.

C. Victoriensis, sp. nov. Minus angustus; sat nitidus; niger, antennis (clava excepta) pedibusque rufis; setis brevibus aureis sat dense vestitus; prothorace minus fortiter minus crebre, elytris leviter obscure fere subcrasse, punctulatis; capite planato vix perspicue punctulato fovea mediana impresso, margine antico explanato et (maris) profunde emarginato. Long., $\frac{3}{4}$—$\frac{4}{5}$ l.; lat., $\frac{1}{3}$ l.

Victoria; Alpine district; in fungi growing on trees.

OROPHIUS.

O. dilutipes, sp. nov. Nitidus; fere glaber; nigro-piceus, elytris abdomineque obscure rufescentibus, antennis (clava excepta) pedibusque testaceis; capite prothoraceque obscure subtilissime, elytris minus subtiliter, minus crebre punctulatis.

Maris capite antice perpendiculari, parte perpendiculari subcarinato-marginato et superne utrinque anguliformi; mandibulis porrectis, quam caput vix brevioribus, apice bifidis.

Feminæ capite æquali; mandibulis sat brevibus. Long., 1 l.; lat., $\frac{1}{3}$ l.

The prothorax is scarcely so wide as long, and is gently contracted from the base forwards, with its front margin considerably and roundly produced.

Victoria; Alpine district; in fungi growing on trees.

CISTELIDÆ.

ANAXO.

A. æreus, sp. nov. Sat nitidus; sat dense albido-pubescens; æreus; palpis (articulo ultimo excepto), antennarum articulis 2° 3° que (hujus apice infuscato) et articulorum nonnullorum sequentium basi, tibiis (his apicem versus infuscatis) tarsisque, rufis; capite angusto elongato, confertim subrugulose (labro crasse sparsim excepto) punctulato; prothorace sat parallelo, antice leviter rotundato-angustato, ut caput (sed etiam magis confertim) punctulato, quam latiori fere longiori, postice late leviter longitudinaliter canaliculato; elytris sat parallelis, quam prothorax minus quam duplo latioribus, punctulato-striatis, striis suturam prope sat pro

fundis apicem versus obsoletescentibus, interstitiis punctulatis et transversim rugatis; antennarum articulo 3° quam 4^us^ paullo longiori, 11° quam 10^us^ vix minori.

Variat antennis tibiisque magis nigris vel magis rufis. Long., 4 l.; lat., 1 l.

I have not been able to satisfy myself as to the validity of the characters of the Australian genera which Mr. Bates has characterised near *Æthyssius* (Atractus). The shortness of the apical joint of the antennæ seems to vary with the sex, and also with the species; nor do I find the slight elongation of the second joint of the maxillary palpi at all a workable character, as it would lead to the separation into different genera of species that are (even as *species*) very closely allied. In the present insect the apical antennal joint is in one sex not, and in the other scarcely shorter than the tenth joint; indeed, I cannot find much to distinguish the insect from *Æthyssius*. It, however, resembles *A. brevicornis*, Bates, too much in general facies to be separated from it generically, in the absence of strongly-marked characters.

The species of this genus have much superficial resemblance to *Leptura*.

Victoria; Alpine district; on flowers.

A. Lindensis, sp. nov. Sat nitidus; albido-pubescens; niger vix æneus, femorum basi tibiisque flavis, his apicem versus plus minusve infuscatis, exemplorum nonullorum antennis basi obscure rufis; ut præcedens sculpturatus; capite paullo minus elongato, quam prothorax haud angustiori; prothorace vix canaliculato, antice vix angustato; elytris fere ut præcedentis sed minus parallelis, retrorsum a basi (præsertim maris) manifeste angustatis; antennarum articulo 3° quam 4^us^ vix longiori, apicali quam 10^us^ sat breviori. Long., 3 l.; lat., $\frac{4}{5}$ l.

S. Australia; on flowers near Port Lincoln.

A. cylindricus, Germ. (var.? *obscurus*). Ab exemplo typico differt antennis paullo magis elongatis, his pedibusque totis nigropiceis.

S. Australia; near Port Lincoln.

A. affinis, sp. nov. Sat nitidus; albido-pubescens; obscure niger, elytris fusco-æneis, pedibus (horum femoribus apice late nigris) antennarum basi palpis labroque testaceis; fere ut *A. æreus* sculpturatus sed elytris magis subtiliter punctulatis; capite prothoraceque fere ut *A. Lindensis*, sed hoc ante basin fovea rotunda impresso; elytris (sculptura excepta) ut *A. ærei*; antennis quoque ut *A. ærei*. Long., 4 l.; lat., 1 l.

Like *A. Lindensis*, this species is at once distinguished from

A. æreus by its much wider head and its prothorax scarcely at all narrowed in front. From *A. Lindensis* it differs apart from colour and the finer elytral sculpture by the relatively longer third and apical joints of the antennæ, the former being markedly longer than the fourth, and the latter being scarcely, if at all, shorter than the tenth, while in *A. Lindensis* of both sexes it is quite evidently shorter.

S. Australia; near Port Lincoln.

A. ater, sp. nov. Nitidus; pilis erectis albidis vestitus; niger-rimus, palpis (articulo apicali excepto) mandibulisque rufescentibus; capite planato, crebre (labro sat sparsim) fortiter punctulato; oculis sat prominulis; prothorace sat parallelo quam caput vix latiori, subfortiter minus crebre nec rugulose punctulato, antice leviter obscure impresso, ante basin fovea magna rotunda profunda instructo; elytris sat parallelis quam prothorax minus quam duplo latioribus, sat fortiter (latera versus minus fortiter) punctulato-striatis, interstitiis sat crasse punctulatis et transversim rugatis; antennarum articulo 3° quam 4^{us} fere sesqui longiori, apicali quam 10^{us} vix breviori.

Maris femoribus posticis subtus late subdentatis; tibiis posticis flexuosis, in medio valde compressis et extus dilatatis; tibiis intermediis arcuatis. Long., 3 l.; lat., $\frac{4}{5}$ l.

The sculpture of this species is very similar to that of the S. Australian insect, which I take to be *A. brevicornis*, Bates, the prothorax being much less closely punctured than that of any of the preceding three species. From *A. brevicornis* (apart from size and color) it differs by its remarkable male characters. The hind femora are not, strictly speaking, "toothed," but their lower outline appears to be formed by two lines which meet in the middle in a distinct angle. It also differs from its allies in its eyes being evidently more prominent.

Victoria; Alpine district.

A. sparsus, sp. nov. Angustus; nitidus; fere glaber (? exemplo abraso); niger, antennarum basi mandibulis pedibusque rufescentibus; capite quam prothorax sat angustiori, fortiter minus crebre punctulato; prothorace leviter transverso sat parallelo crebrius subfortiter punctulato, dorso obscure depresso; elytris parallelis quam prothorax minus quam duplo latioribus, fortiter (latera versus paullo minus fortiter) punctulato-striatis, interstitiis subconvexis sparsim subtiliter punctulatis haud transversim rugatis; antennarum articulo 3° quam 4^{us} paullo longiori, apicali quam 10^{us} vix breviori. Long., 6 l.; lat., 1$\frac{4}{5}$ l.

Resembles *Anaxo* (*Allecula*) *cylindricus*, Germ., but differs from

it *inter alia* by its still narrower and more parallel form, by the punctures of its head more sparse and large, by its prothorax a little less closely and more strongly punctured, and by the striæ of its elytra more strongly, and their interstices much less closely and strongly punctured. From the widely-distributed S. Australian insect, which I regard as *A. brevicornis*, Bates, it differs *inter alia* by its more parallel form, its less-closely punctured head, and its elytra quite differently sculptured.

Victoria; in the collection of C. French, Esq.

A. puncticeps, sp. nov. Nitidus; obscure albido-pubescens; fuscus, antennis femoribus sternorum lateribus abdomineque nigris; capite quam prothorax paullo angustiori, creberrime (antice gradatim minus crebre) fortius sat rugulose punctulato; prothorace quam latiori vix longiori sat parallelo, medio ante basin leviter impresso, confertim sat subtiliter punctulato; elytris minus parallelis quam prothorax fere duplo latioribus, sat fortiter punctulato-striatis, striis latera versus obsoletescentibus, interstitiis crebrius fortius punctulatis vix transversim rugatis; antennarum articulo 3° quam 4^us^ paullo longiori, apicali quam 10^us^ manifeste breviori. Long., $5\frac{1}{2}$ l.; lat., 2 l.

Very similar to *A. cylindricus*, Germ., in form, from which (apart from colour) it differs *inter alia* by its conspicuously narrower head and prothorax, by its somewhat longer and more slender legs and antennæ, and by its less-strongly impressed elytral striæ, which become much more enfeebled towards the lateral margins.

This species bears a superfical resemblance to *Homotrysis fuscipennis*, Blessig, from which its simply pointed mandibles at once distinguish it.

Victoria; in the collection of C. French, Esq.

A. occidentalis, sp. nov. Nitidus (capite prothoraceque fere subopacis); vix albido-pubescens (? exemplo abraso); niger, elytris fuscis, labro mandibulis palporum antennarumque basi et pedibus fusco-testaceis; capite quam prothorax sat angustiori, sat confertim sat rugulose (labro sparsissime) punctulato, oculis sat prominulis supra minus remotis; prothorace quam longiori vix latiori, creberrime subtiliter subconfluenter sat aspere punctulato, ante basin leviter impresso, antice manifeste angustato, lateribus antice arcuatis; elytris postice leviter dilatatis, fortiter (latera versus multo minus fortiter) punctulato-striatis, interstitiis subconvexis sparsim subtiliter punctulatis; antennarum articulo 3° quam 4^us^ sat longiori, apicali quam 10^us^ paullo breviori. Long., 4 l.; lat., $1\frac{3}{10}$ l.

The extremely close puncturation of the prothorax, which

renders the surface subopaque, and tends to become confluent in forming longitudinal wrinkles, will at once distinguish this species from its previously described congeners.

The apical joint of the maxillary palpi is a little shorter and more widely cultriform than in the allied species. This character is suggestive of *Licimnius*, Bates, but I do not find it accompanied by the other characters mentioned as distinctive of that genus. It is likely that Mr. Bates would regard this as a new generic form.

W. Australia.

The following is a tabulation of the hitherto described species of Anaxo :—

A. Prothorax not subopaque through the presence of very close longitudinally confluent puncturation.
  B. Puncturation of head very noticeably closer than of prothorax.
    C. Interstices of elytra closely punctured.
      D. Legs entirely black ... ... ater, Blackb.
      DD. Legs partly yellow ... ... brevicornis, Bates
    CC. Interstices of elytra sparingly punctured. ... ... puncticeps, Blackb.
  BB. Puncturation of head and prothorax equally (or nearly so) close
    C. Species of a distinctly metallic tone of color.
      D. Head not (or scarcely) narrower than prothorax.
        E. Apical joint of antennæ distinctly shorter than tenth joint. ... ... Lindensis, Blackb.
        EE. Apical joint of antennæ not shorter than tenth joint ... ... affinis, Blackb.
      DD. Head much narrower than prothorax. ... ... æreus, Blackb.
    CC. Color not at all metallic.
      D. Interstices of elytra very finely and very sparingly punctulate ... ... sparsus, Blackb.
      DD. Interstices of elytra much more closely and strongly punctulate ... ... cylindricus, Germ.

AA. Prothorax subopaque through the presence of very close longitudinally confluent puncturation. occidentalis, Blackb.

The description of *A. fusco-violaceus*, Fairm., does not enable me to place that species in my tabulation, but it appears to differ from all the above in its cyaneous or violaceous colour.

N.B.—It appears to me (as already intimated) difficult to characterise *Anaxo* by very satisfactory structural characters among the Australian *Cistelidæ* having the mandibles simply pointed at the apex, the head well-prolonged in front, the apical joint of the maxillary palpi elongate-cultriform, and the legs and antennæ more or less stout and short. Its species (so far as known to me) are distinguished by their more or less parallel form and obscure coloring, none of them being brilliantly metallic (as are *Ethyssius* and *Alcmæonis)* or brightly colored or with markings on elytra or prothorax (as are *Licymnius*, *Chromomæa* and *Apellatus)*. The eyes are not approximated to each other in either sex. There are also slight structural characters attributed to each of the genera just named which are not found in any of the species I have called *Anaxo*. *Synatractus* seems to be remarkable by the very elongate apical joint of its antennæ, and *Lisa* and *Ismarus* are both described as having very slender antennæ.

The sexual differences in *Anaxo* appear to be but slight, except in *A. ater* (whose sexual characters render its place in *Anaxo* doubtful); the males seem to be distinguished merely by smaller size and narrower form, by the intercoxal process of the basal ventral segment being somewhat elevated above the general plane of the segment, by a tendency to diminution of size on the apical joint of the antennæ, and (at least in some species) very slight differences in the apex of the last dorsal segment.

APELLATUS.

The species of this genus resemble each other very closely in general appearance, but have extremely strongly marked and distinctive sexual characters in the antennæ of the males (so far as I have seen). The following names have been applied to species appertaining to it:—*amœnus*, Pasc. (N. S. W.), formerly *lateralis*, Pasc., (nom. præocc.); *lateralis*, Bohem. (N.S.W.) (Euomma); *palpalis*, Macl. (Qu.); *Mastersi*, Macl. (Qu.); *apicalis*, Black. (W. Austr.).

I have before me three species, of two of them both sexes. The males differ from the females in the smaller size, in their very much longer palpi (the second joint very long and slender, the apical curved and very elongate-cultriform), in the closer approximation of their eyes, in the remarkable dilatation of some of the intermediate joints of their antennæ, in their more strongly arched tibiæ, and in the intercoxal process of the basal ventral segment being a little elevated anteriorly and not quite continuing the plane of the general surface of the segment.

It appears to me pretty certain that *A. amœnus*, Pasc., is a mere synonym of *lateralis*, Bohem., nor can I help thinking that Mr. Pascoe was mistaken in the opinion that he was describing the male. If it was the male, either the sexual characters of that species are very different from those of allied forms, or the author passed over unnoticed a very remarkable structure in the palpi. The description of the antennæ, moreover (subfiliform with the apical three joints a little shorter than the rest and somewhat compressed), seems suggestive of a female, although I should say that I have not seen an *Apellatus* of either sex whose antennæ quite present those characters. I conclude therefore that *A. lateralis*, Bohem. (lateralis, Pasc.—amœnus, Pasc.), is a species I have not seen of which it is doubtful whether the male is known.

I should say it is equally certain that *A. Mastersi*, Macl., is the female of *A. palpalis*, Macl. The colour differences of the two are of no account—the two species before me, of which I have both sexes, vary even more in colour. It is possible that *A. palpalis*, Macl., is the same as *A. lateralis*, Bohem., but this I think wants proof. One of the species before me may, I think, be Sir W. Macleay's insect (although its habitat in South Australia suggests doubt), but that author's description is not definite enough for certainty. If it be *palpalis*, I think it is probable that *palpalis* is distinct from *lateralis*, as the antennal structure in my examples does not quite agree with that of *lateralis*.*

I may add that the absence or presence of a slight pubescence on species of *Apellatus* is of no importance; very fresh specimens have a slight pubescence which is easily rubbed off.

A. apicalis, from Western Australia, is known only by a female, but it is at once distinguishable from the other *Apellati* by its different puncturation as well as different *style* of marking.

A. nodicornis, sp. nov. Leviter sparsim pubescens; testaceus vel rufo-testaceus, plus minusve infuscatus, lateribus apice (et nonnullis exemplis sutura) elytrorum nigris.

Maris antennarum articulo 7° fortiter dilatato; tibiarum posticarum parte apicali subito latiori et paullo ante apicem subdentata.

Feminæ antennarum articulis 3-10 inter se sat æqualibus. Long., 3—4½ l.; lat., ⅘ l.—1⅖ l.

The ordinarily coloured specimens are of bright rufo-testaceous

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* Since writing the above I have examined the types of *A. palpalis* and *A. Mastersi* in the Macleay Museum. They are certainly male and female of one species, and are identical with the S. Australian species mentioned above. There are in the Macleay Museum also two examples labelled "*A. lateralis*, Pasc," and these also are identical with *A. palpalis*.

colour—the elytra pale testaceous-brown, with a blackish vitta commencing on each shoulder and gradually widening hindward till the two combine and fill up all the apex. The labrum and clypeus are deeply and pretty closely punctured, the back of the head and the prothorax finely and closely but not deeply. The prothorax has a wide impression down the middle and a small one close to the base on either side. The elytra are punctulate-striate, the interstices punctured.

This species is extremely like the S. Australian one referred to above, but differs from it in the male having all the joints 3-11 of the antennæ subparallel and but little compressed (8-10 shorter than the rest, 11 longer), except the seventh joint, which is strongly compressed and evidently arcuate, with its external apex produced in a short spine; joints 8-10 are a little narrower as well as shorter than 3-6, and 9-10 are a trifle narrower than 8; joint 3 is distinctly shorter than 4. In the female joints 3-11 are very uniform. The maxillary palpi of the male set back reach the prothorax.

Victoria; Alpine district; under bark of Eucalyptus.

A. nigricornis, sp. nov. Leviter sparsim pubescens; testaceus, prothorace rufescenti, antennis (basi excepta) palpis elytrorum lateribus sutura apiceque et abdominis lateribus apiceque nigris, tibiis tarsisque infuscatis.

Maris antennarum articulis 4-10 sat æqualibus minus fortiter compressis, apicali quam præcedentes longiori.

Femina latet. Long., 3 l.; lat., $\frac{4}{5}$ l.

This species scarcely differs from *A. nodicornis* except in its black antennæ and palpi and in the different structure of the male antennæ. The basal joint of the antennæ is red and the second reddish.

Victoria; Alpine district.

CHROMOMÆA.

C. maculicornis, sp. nov. Sat elongata; postice angustata; glabra; subnitida; ferrugineo-rufa; capite (labro excepto), mandibulis apice, antennis (articulis 1° 2° 3° 8^{i} apice 9° 11^{i} que apice exceptis), scutello, elytrorum basi sutura lateribus apiceque, prosterni medio, metasterni lateribus, femorum apice, tibiarum basi apiceque, et tarsis, nigris vel nigro-piceis; capite fortiter sat crebre punctulato, oculis inter se remotis; prothorace quam latiori vix longiori, antice paullo angustato, ante basin fovea mediana elongata instructo, subtiliter sparsius punctulato, lateribus vix arcuatis, angulis posticis obtusis; elytris fortiter punctulato-striatis, interstitiis sat fortiter convexis sparsim subtiliter punctulatis. Long., $5\frac{1}{3}$ l.; lat., $1\frac{3}{5}$ l.

A species presenting an extremely intricate mixture of reddish ferruginous and black colouring, the black usually shading off vaguely into piceous and here and there inclining to reddish. It is probably allied to *C. pallida*, Bates, but differs not only in colour (especially in the variegated antennæ) but also in the puncturation of several parts, notably the interstices of the elytra which in Mr. Bates' species are said to be "rather closely punctured," while in the present species the punctures on the interstices are about as sparse as they could well be. The antennæ are somewhat slender, not at all serrate, the third joint not much shorter than the fourth and fifth together.

Victoria; in the collection of C. French, Esq.

C. rufipennis, sp. nov. Minus elongata; minus parallela; postice angustata; sat nitida; nigra, elytris rufis (margine summo laterali nigro) sat dense sericeo-pubescentibus; capite crassius crebrius punctulato; oculis inter se remotis; prothorace quam longiori vix latiori, antice paullo angustato, ante basin fovea mediana rotundata magna profunda instructo, sat crebre sat fortiter punctulato, lateribus vix arcuatis, angulis posticis fere rectis; elytris punctulato-striatis, interstitiis (alternis quam cetera magis fortiter) convexis crebre punctulatis.

A very distinct species, suggestive by its colours—and to some extent by its form—of some vars. of *Stenoderus suturalis*, Oliv. The antennæ are moderately stout, the intermediate joints a little dilated within so as to present a slightly serrated appearance; the third joint is considerably longer than the fourth.

Victoria.

PSEUDOCISTELA (gen. nov.).

Caput antice sat productum; mandibulæ apice acuminatæ, haud bifidæ; palporum maxillarium articulus secundus brevis robustus; apicalis latissime (fere ut *Metistetis*), labialium leviter, triangularis; oculi haud approximati; antennæ sat (vix minus quam *Anaxo*) robustæ sat elongatæ; prothorax transversus a basi antrorsum fortiter rotundatim angustatus; corpus ovale, alatum.

The little *Cistelid* for which I propose this name cannot, I think, be referred to any previously characterised genus. Its oval form distinguishes it from most, if not all, of the genera having the head produced into a beak, and the mandibles simply pointed. In Lacordaire's arrangement it would fall into the "groupe Cistelides vraies." The sexual differences seem to be very slight; the males are somewhat narrower and more attenuated behind, with the antennæ more slender (but scarcely longer) than those of the female, and the intercostal process of the hind body

slightly raised in front, the hind body itself being narrower and more convex transversely. The general facies is suggestive of *Cistela*.

P. ovalis, sp. nov. Sat nitida; ovalis; sparsim brevissime griseo-vel fulvo-pubescens; nigra, palpis antennarum basi tibiis anticis et unguiculis omnibus rufo-testaceis; supra crebre subtiliter sat profunde sat æqualiter punctulata; elytris prope suturam obsoletius striatis; corpore subtus subfortiter minus crebre punctulato.

Variat antennarum parte dimidia basali et pedibus totis (vel plus minusve), rufo-testaceis. Long., $2\frac{1}{5}$—$2\frac{1}{2}$ l.; lat., $\frac{4}{5}$—1 l.

The base of the prothorax is as wide as the base of the elytra; in the males the greatest width is in front of the middle of the elytra, which is very evidently, but not very much, wider than that of the base; in the females the elytra are evidently wider. and at their widest about the middle.

Victoria; Alpine district; on flowers.

HOMOTRYSIS.

The Australian *Cistelidæ* having bifid mandibles, described prior to 1866, were all referred by the authors to *Allecula* and *Cistela*. None of them, I think, were satisfactorily described (unless it be *Allecula fuscipennis*, Blessig), even Germar's descriptions being unreliable, because he placed in *Allecula* at least one species having simple mandibles; the rest are unrecognisable, unless the types be referred to. In 1866 (Journ. of Ent.) Mr. Pascoe very briefly characterised three new genera for this group of *Cistelidæ—Metistete*, *Homotrysis*, and *Hybrenia*. I think I have not seen either of the species their author placed in *Hybrenia*, but I am unable to regard the characters by which he distinguished them from *Homotrysis* as satisfactory, inasmuch as one of them (the approximation of the eyes) I find to vary considerably (and even sexually) among species that certainly seem incapable of being suitably placed in different genera, and the other (the close application of the prothorax to the elytra) seems to me to be presented by nearly all the Australian *Cistelidæ* of this group, even *H. microderes* (I have no doubt *Allecula fuscipennis*, Blessig), which Mr. Pascoe himself placed in *Homotrysis*, having the prothorax very closely fitted to the elytra, and the eyes considerably approximated in the male. I do not, of course, say that *Hybrenia* is not a good genus, only that the characters given to distinguish it from *Homotrysis* appear to me insufficient. As to *Homotrysis*, I take it to be a good genus, as the Australian species near *Allecula* seem to be unsuitably placed in the latter genus. *Metistete* also appears to be a good genus, its most distinctive character (not mentioned by its author) being

the absence of wings for flying. In 1879 Heer Haag-Rutenberg characterised two new genera for Australian *Cistelidæ*—*Lisa* and *Ismarus*—but without any statement whether they belong to the section with simple or apically bifid mandibles. The descriptions of these genera are most unsatisfactory (*e.g.*, implying that the maxillary palpi have only three joints, and in one place calling the labrum of *Ismarus* "abgerundet," and in another "gerade"). I am inclined to hazard a guess that *Ismarus* is a synonym of *Metistete*. *Lisa* is characterised at some length, but without the mention of any character that strikes me as really valuable for distinction among allied Australian forms, and the author at the end of his diagnosis remarks that the genus is distinguished by the large apical joint of its maxillary palpi, its "kissenartig gewölbte" prothorax, and its long legs and antennæ. I find some or all of these characters in species before me, but I am quite unable to regard them as generic, unless one makes a new genus for nearly every species of the group. In the description of the *species* on which *Lisa* is founded *(L. singularis)* there is, however, mention of two characters which appear to me much more likely to be workable for generic distinction than any of those the author calls generic. These are the presence of a dilatation in the middle of the inner margin of the front tibiæ (said to be a male character—probably correctly, I think) and of a foveate sulcus near the lateral margin of the elytra. I find each of these characters (apparently even in a more developed form than in the type) in several species before me, and *Allecula elongata*, Macl., presents the latter of them, but I have not seen them both in the same specimen—perhaps because I do not possess a male of a species having the elytral sulcus. I incline to think that the Australian species of the *Cistelidæ* allied to *Allecula* can be satisfactorily divided into genera only by their sexual characters, for which division our knowledge of species is as yet insufficient. My conclusion, therefore, is that the first genus characterised for them *(Homotrysis)* may stand as against *Allecula*, and I am able to point out that *Metistete* is apterous, and therefore distinguishable from *Homotrysis*, while it seems that the characters assigned to *Hybrenia* and *Ismarus* are shared by numerous forms incapable of being considered as strictly congeneric (although it is probable enough that when both sexes of a large number of Northern forms are known there may appear good reason for retaining those names and re-characterising them).

Among the *Cistelidæ* of this group in my collection there are several species that it would be quite impossible to associate with any of the genera mentioned above on account of complete difference in facies, although I have not been able to satisfy

myself of the existence of structural characters that could be relied upon as generically invariable. These are of oval form, and are much less elongate than any of the above mentioned genera, their shape being suggestive of *Harpalus* and in some cases of *Choleva*, while *Hybrenia*, &c., approximate more to the appearance of *Telephorus*, or *Tenebrio*. I have spent some time in examining these insects in search of a workable method of *defining* this distinction provisionally until the comparison of both sexes of a large number of species be possible (which will probably lead to a much more scientific diagnosis), and have found that this difference in facies seems reliably associated with a difference in the comparative length of the femora and width of the body. In *Homotrysis*, *Hybrenia*, &c., the hind femora, if laid out at right angles to the central longitudinal line of the body, extend by at least a third of their length beyond the external margin of the elytral epipleuræ, while in these more oval forms the projecting piece of the femora similarly placed is much shorter. In these latter, also, the head, as compared with the prothorax is very much narrower. I find it necessary to characterise two new genera for them, as there are two very distinct types among them differing in the general facies and in the structure of the femora. I divide the Australian genera of *Cistelidæ* with bifid mandibles as follows:—

A. Hind femora much longer than the distance from their base to the external margin of the elytral epipleuræ.
  B. Apterous ... ... Metistete
  BB. Winged ... ... Homotrysis
AA. Hind femora little (or scarcely) longer than the distance from their base to the external margin of the elytral epipleuræ.
  B. Tibial depression beneath femora very long. Facies of *Harpalides* ... ... Scaletomerus
  BB. Tibial depression beneath femora much shorter. Facies of *Choleva* or *Platydema* Nocar

Homotrysis (as I regard it) has been subdivided thus (assuming Haag-Rutenberg's species to have mandibles bifid at the apex):—

A. Apical joint of maxillary palpi of ordinary size.
  B. Eyes approximate. Prothorax closely applied to elytra ... ... Hybrenia
  BB. Eyes more distant. Prothorax less closely fitted to elytra ... ... Homotrysis
AA. Apical joint of maxillary palpi very large ... Lisa

Finding myself unable (as already pointed out) to determine to which of *Hybrenia*, *Homotrysis*, and *Lisa* should be referred

certain of the species before me, which certainly belong to *Homotrysis* under the former of the above tabulations, I have thought it best to disregard for the present these two unsatisfactory *generic* names, and to call *Homotrysis* all the species that would be referred to it by the former of the above two tabulations.

The following is a tabulation of the species described below, together with two or three other species introduced for the sake of comparison :—

A. Interval between eyes less (at least in the male) than the width of either eye as seen from above.
  B. Upper surface densely clothed with erect pilosity.
    C. Punctures of elytral striæ scarcely distinct, those of the interstices very conspicuous.
      D. Legs and antennæ entirely testaceous or rufo-testaceous.
        E. Elytra with well-defined dark piceous markings ... ... limbata, Blackb.
        EE. Elytra uniformly rufous ... rufa, Blackb.
      DD. Legs and antennæ obscure... fusca, Blackb.
    CC. Punctures of elytral striæ very conspicuous, interstices nearly lævigate, though granulated behind ... ... rugulosa, Boisd.
  BB. Upper surface not clothed with dense erect pilosity, uniformly coloured
    C. Elytra somewhat evenly sculptured.
      D. Elytra black or bluish.
        E. Size large (long. about 6 l. or more).
          F. Front part of elytral striæ punctured conspicuously, and with much larger punctures than the interstices ... nitida, Blackb.
          FF. Elytral striæ in front (especially near suture) punctured scarcely differently from the interstices tenebrioides, Blackb.
        EE. Size small (long. about 4 l. or less)
          F. Antennæ, tibiæ, and tarsi testaceous red ... ruficornis, Blackb.

FF. Antennæ, tibiæ, and tarsi black	lugubris, Blackb.
DD. Elytra fulvous brown ...	fulvipennis, Blessig.
CC. Elytra in front with a deep foveate sulcus near the margin	princeps, Blackb.
BBB. Upper surface with markings composed of pale pubescence...	maculata, Haag-Rut
AA. Interval between eyes in both sexes greater than the width of either eye as seen from above ...	carbonaria, Germ.

HOMOTRYSIS.

H. maculata, Haag-R. In my collection there are three examples (from the N. Territory) which must be referred, I think, to this species, which was described on a specimen from Cape York, and seems to be a very variable insect, as no two of the three are quite identical with each other. One of them is nearly black, and has a strong tooth on the inner margin of the front tibiæ (being probably a male). The other two are coloured in accordance with the description; one of them, however, has the elytra much more roughly sculptured than the other and than the type (according to description), and is considerably more parallel, and may perhaps represent a distinct species (it is very much broken, unfortunately), but the pubescent markings on the upper surface of this species are so peculiar that it seems hardly likely two species exactly possessing them should occur in the same locality. The principal difficulty of identification consists in Haag-Rutenberg describing the under surface as "vix punctatum," whereas in all three of my specimens it is very distinctly punctured. I think the author must have made a mistake in this character, as it seems hardly probable that a surface clothed with strong hairs should not be punctulate.

H. carbonaria, Germ. I have lately observed that Haag-Rutenberg mentions his having seen the type of this species, and also of *H. tristis*, Germ., and does not speak of their being identical. Nevertheless, I adhere to the opinion I have already expressed, that *H. carbonaria* is the male, and *H. tristis* the female, of one species. At any rate, all the examples I have seen agreeing with the description of each are of the sexes just named. The males have the eyes evidently more approximated than the females, and, owing to the narrowness of the hind body, the sides of the elytra extending beyond it, appear in certain lights to have a fuscous margin, the existence of which I believe was by a careless observation stated by Germar to constitute a variety. The undersurface of the elytra is of a fuscous colour. In *H. fuscipennis*, Blessig, I find a similar sexual difference in the pilosity of the prothorax.

H. lugubris, sp. nov. Elongata, sat parallela; minus convexa; sat nitida; sparsim obscure griseo-pubescens; atra, antennis pedibusque picescentibus, unguiculis testaceis; capite sparsim fortiter punctulato, oculis sat approximatis; prothorace quam longiori plus quam sesquilatiori, vix perspicue (ante basin profundius) canaliculato, ante basin utrinque manifeste impresso, fortius sat crebre punctulato, a basi antrorsum sinuatim angustato, basi leviter bisinuata quam margo anticus sat latiori, angulis posticis fere rectis apice summo rotundatis, elytris crebre fortius punctulatis, fortiter striatis, interstitiis transversim rugatis; corpore subtus sparsius (abdomine magis sparsim) punctulato; antennis quam corporis dimidium sat longioribus, articulo 3° quam 1^us^ duplo (quam 4^us^ paullo) longiori. Long., $3\frac{4}{5}$ l.; lat., $1\frac{1}{5}$ l. (vix).

I believe the specimen before me to be a male, on account of the intercoxal process of the hind body being strongly elevated above the general plane of the basal segment; the hind body being wider and less convex transversely than is usual in males of this genus suggests a doubt, however.

Placed beside *H. carbonaria*, Germ., this species is considerably smaller, and is devoid of erect hairs, except on the front part of the head; it is considerably narrower, more parallel, and less convex; the head is much less closely punctured, the eyes are evidently more approximate, the surface of the prothorax is differently impressed, and a little less closely punctured, with hind angles more tending to be prominent laterally; the elytra are less nitid, and more finely and closely punctured and wrinkled; the third and fourth joints of the antennæ are relatively shorter, and the whole antennæ are more slender.

The narrow form, slight convexity, absence of erect pilosity, somewhat different antennæ, and absence of a fovea on the apical ventral segment suggest the probability of this species being eventually separated generically from *H. carbonaria*, but I do not think it can be referred to any genus yet characterised as distinct from *Homotrysis*.

Victoria; Alpine district.

H. ruficornis, sp. nov. Elongata; sat parallela, minus convexa; minus nitida; pilis fulvis brevibus suberectis obscure vestita; nigra, ore labro palpis antennis tibiis tarsisque testaceo-rufis; capite prothoraceque subtilius sat crebre punctulatis; oculis sat approximatis; prothorace (puncturatione excepta) ut *H. lugubris*; elytris confertim subtilius punctulatis, sat fortiter striatis, interstitiis vix perspicue transversim rugatis; corpore subtus sat crebre subfortiter (abdomine multo minus fortiter) punctulato; antennis (colore excepto) ut *H. lugubris*. Long., 4 l.; lat., $1\frac{2}{5}$ l.

Very near the preceding in all structural characters, but very different in colouring and sculpture, the prothorax being much more closely punctured, the elytra more finely and closely punctured and more feebly striated, &c. The eyes are somewhat larger, and still more approximated, the interval between them being only about half as wide as the width of either eye looked at from above; this may be sexual, but I find no decided character to indicate the sex of either species, and incline to think that both examples are males.

Queensland; sent from Brisbane by F. M. Bailey, Esq.

H. rugulosa, Boisd. (?). Modice elongata; sat parallela; minus convexa; nitida; pilis elongatis erectis sat crebre vestita; fusca, capite et corporis subtus partibus nonnullis fere nigris, elytrorum sutura rufa; capite sat sparsim minus crebre punctulato, oculis modice approximatis; prothorace quam longiori fere dimidio (postice quam antice haud multo) latiori, sparsim fortiter punctulato, late leviter canaliculato, ante basin utrinque impresso, lateribus modice arcuatis, basi leviter bisinuata, angulis posticis leviter obtusis; elytris vix striatis, potius puncturis sat magnis seriatim ornatis, interstitiis sat planis sparsim seriatim punctulatis postice subrugulosis; antennis quam corporis dimidium longioribus; articulo 3° quam 4^{us} paullo breviori; corpore subtus sparsim minus fortiter punctulato, segmento ventrali apicali plus minusve profunde impresso.

Maris quam feminæ antennis longioribus, paullo magis compressis (exempli typici articulis 9-11 carentibus). Long., $2\frac{4}{5}$ l.—$3\frac{2}{5}$ l.; lat., $\frac{4}{5}$ l.—1 l.

This species has much resemblance to the preceding, but is at once distinguishable from all its allies known to me by the long erect pilosity with which it is clothed and the brightly nitid very thinly punctured interstices of its elytral striæ, which become a little uneven and transversely rugulose towards the apex. The interval between the eyes is much less in both sexes than the width of either eye as seen from above. Unless the type of *Allecula rugulosa*, Boisd., can be referred to it will be impossible to identify any species with it except doubtfully, as the description (of eight words) is quite insufficient, but the colour and pilosity, as mentioned, agreeing with the specimens before me, and being unusual in the genus, and the species before me being a widely distributed one, is very likely to be what Boisduval described.

S. Australia and Victoria.

H. limbata, sp. nov. Sat elongata; modice parallela, antice posticeque angustata; minus convexa; nitida; pilis minus

brevibus sat dense vestita; rufa, elytris ad latera vitta picea ab humeris retrorsum gradatim latiori ornatis; capite fortiter sat crebre punctulato; oculis sat approximatis; prothorace quam longiori parum latiori, fortiter minus crebre punctulato, haud vel vix canaliculato, ante basin in medio late leviter utrinque oblique sat fortiter impresso, abasi antrorsum sinuatim angustato, basi bisinuata, angulis posticis subacutis vix extrorsum directis; elytris sat fortiter sat crebre punctulatis, punctulato striatis, puncturis in striis et in interstitiis inter se sat æqualibus; antennis quam corporis dimidium paullo longioribus, articulo 3° quam 4^{us} subbreviori; corpore subtus sat fortiter punctulato. Long., $3\frac{3}{5}$—$4\frac{1}{5}$ l.; lat., 1—$1\frac{1}{5}$ l.

The sexual differences in this species seem very slight. The hind-body of the male is much narrower and more convex transversely than that of the female, and the eyes in the same sex are perhaps a trifle more approximated; in both sexes the interval between the eyes is very much less wide than either eye as seen from above. The colours and markings of this species are considerably like those of an *Apellatus*. The vitta on each elytron dilates hindward to the extent of filling up the apical portion but (in all the examples I have seen) leaves the suture and margin narrowly red.

Victoria; Alpine district.

H. rufa, sp. nov. Modice elongata; sat parallela; sat convexa; minus nitida; pilis erectis sat brevibus densius vestita; rufa, antennis pedibus abdomineque plus minusve dilutioribus, nonnullis exemplis capite obscuriori; hoc fortiter sat crebre punctulato; oculis subapproximatis; prothorace quam longiori fere sesqui latiori, late vix perspicue canaliculato, ante basin utrinque obscure impresso, crebre fortiter punctulato, antice quam postice paullo angustiori, lateribus sat rotundatis, basi leviter bisinuata, angulis posticis obtusis; elytris crebre subfortiter punctulatis, leviter striatis; antennis quam corporis duæ partes paullo longioribus, articulis 4-10 (præsertim 4) leviter compressis intus subserratis, 3° quam 4^{us} paullo breviori; corpore subtus sparsim minus fortiter punctulato, segmento ultimo ventrali late longitudinaliter impresso. Long., $3\frac{3}{5}$ l.; lat., 1 l.—$1\frac{1}{5}$ l. (vix).

A puzzling species, very unlike *H. carbonaria*, Germ., but in almost every point of difference connected with it by intermediate species. The third antennal joint shorter than the fourth (for example) is certainly suggestive of generic distinction, but this insect cannot, I think, be separated generically from *H. fusca*, in

which the proportion of the third and fourth joints is reversed. The interval between the eyes is considerably less than the width of either eye as seen from above. The apical joint of the antennæ is considerably longer than the tenth. The sexual distinctions seem very slight; in the male the intercoxal process of the hind body is conspicuously elevated. The metasternum is extremely tumid, and is in many examples considerably darker in colour than the hind-body.

S. Australia; near Adelaide.

H. tenebrioides, sp. nov. Elongata; sat parallela, pone medium subdilatata; modice convexa; sat nitida; pilis brevibus erectis sparsim obscure vestita; cœruleo-nigra, prothorace læte cyaneo-micans, sutura obscure rufescenti, labro palpis et antennarum apice plus minusve testaceis, pedibus picescentibus; capite crebrius sat fortiter punctulato; oculis sat approximatis; prothorace fere subgibboso, leviter transverso, sparsius sat fortiter punctulato, a basi antrorsum sat fortiter rotundato-angustato, lateribus ante basin leviter sinuatis, dorso antebasin transversim 3-foveolato, basi bisinuato, angulis posticis rectis leviter extrorsum prominulis; elytris crebre sat fortiter punctulatis, sat fortiter striatis, interstitiis transversim rugulosis; antennis ut *H. lugubris*.

Maris tibiis anticis infra basin intus angulatim dilatatis. Long., $6\frac{1}{2}$ l.; lat., $2\frac{1}{5}$ l.

A handsome and distinct species of facies suggestive of *Tenebrio*.

South Australia; basin of Lake Eyre.

H. princeps, sp. nov. Elongata; subparallela, postice acuminata, sat convexa; minus nitida; pilis brevibus suberectis sparsim obscure vestita; cœruleo-nigra, prothorace læte cyaneo-micans; capite sparsius fortius punctulato; oculis approximatis; prothorace fere ut *H. lugubris* sed margine antico bisinuato in medio manifeste rotundato-producto, sparsim fortiter punctulato; elytris sat fortiter sparsius punctulatis, subtiliter striatis, striis subtiliter punctulatis, interstitiis perplanis, margine laterali pone humeros antice profunde sulcato, sulco foveis magnis profundis instructo; antennis fere ut *H. lugubris* sed articulo 3° magis elongato. Long., $8\frac{1}{2}$ l.; lat., 3 l.

I do not find any character decisively indicating the sex of my example of this fine species, which probably points to its being a female, as it is probable that the anterior tibiæ of the male are toothed within. The extremely fine striæ of the elytra, their punctures much finer than those of the interstices, and the absolute flatness of the interstices, together with the remarkable

sulcus with its large foveæ on the sides of the elytra, render this a very distinct insect. It is perhaps just possible (but I think very improbable) that this is a var. of *(Allecula) elongata*, Macl. It is also near *Lisa singularis*, Haag-R., which, however, *inter alia*, has the prothorax "sat dense punctatus."

N. Territory of S. Australia.

H. nitida, sp. nov. (Mas.). Elongata, subparallela, postice sat acuminata; sat convexa; nitida; pilis sat elongatis erectis sparsim vestita; nigra, vix cyaneo-micans, labro antice ferrugineo; capite sat crebre sat fortiter punctulato, oculis subcontiguis; prothorace leviter transverso, subquadrato, a basi antrorsum leviter arcuatim angustato, sparsim sat fortiter punctulato, fere subgibboso, ante basin transversim 3-impresso (impressione media minus perspicua), margine antico bisinuato in medio sat fortiter rotundato-producto, angulis posticis subrectis extrorsum vix prominulis; elytris leviter striatis, striis punctulatis (puncturis anticis sat magnis subquadratis retrorsum gradatim obsoletescentibus), interstitiis sat planis sparsim punctulatis; antennis (exempli typici) carentibus, sinedubio fere ut feminæ, sed paullo magis elongatis; tibiis anticis inmedio intus rotundatim dilatatis. Long., 7 l.; lat., 2 l.

Feminæ oculis paullo minus approximatis, prothorace paullo magis crebre punctulato, tibiis anticis simplicibus, antennis quam corporis dimidium vix longioribus, articulo 3° quam 4^{us} sat longiori; corpore (? abraso) haud piloso. Long., 8 l.; lat., 3 l.

The antennæ (of the female) are in every respect extremely like those of the same sex of *H. carbonaria*, Germ. The punctures in the striæ on the elytra are much larger than those of the interstices.

N. Territory of S. Australia.

H. fusca, sp. nov. Sat elongata; sat parallela; sat nitida; pilis brevibus erectis densius vestita; fusca, elytris suturam versus tibiis tarsisque plus minusve rufescentibus; capite sat crebre fortiter punctulato; oculis approximatis; prothorace quam longiori plus quam sesquilatiori, antice quam postice vix angustiori, quam caput parum latiori, late leviter canaliculato, ante basinutrinque impresso, crasse sparsim punctulato, lateribus leviter arcuatis ante basin bisinuatum subsinuatis, angulis posticis rectis; elytris sat crasse minus crebre punctulatis et subtiliter punctulato-striatis; antennis quam corporis duæpartes vix brevioribus, articulo 3° quam 4^{us} sequentesque parum longiori; segmento ventrali apicali fovea mediana instructo; corpore subtus sparsim punctulato. Long., $3\frac{3}{5}$ l.; lat., $1\frac{1}{5}$ l.

Notable for the generally coarse character of the puncturation, which is at its maximum on the prothorax. The striæ on the elytra are punctulate, but their punctures are little conspicuous, being not much different in character from those of the general surface. I suspect my two examples are both males, and it is probable that the apical ventral segment in the female is less conspicuously foveated.

S. Australia; near Port Lincoln.

BARYCISTELA (gen. nov.).

Caput breve; mandibulæ apice bifidæ; palporum maxillarium articulus secundus robustus quam tertius duplo longior, apicali longitudine sat æqualis; hoc magnus triangulum æquilaterum formans, labialium forma similis sed minor; oculi (maris?) parum approximati; antennæ elongatæ sat graciles, articulus 3^us^ quam 4^us^ paullo brevior; prothorax fortiter transversus, quam elytra vix angustior basi subbisinuatus; femora subtus sulco elongato impressa; tibiæ anticæ apice extus dilatatæ; suturæ ventrales apicales 2 valde impressæ ad latera sat fortiter retrorsum directæ; prosternum inter coxas valde elevatum; corpus robustum, latum, alatum.

Agreeing with *Homotrysis* in the possession of the characters that would entitle to a place in *Allecula*, as tabulated by Lacordaire (viz., short bifid mandibles, head free in repose, anterior coxæ not contiguous, tarsi lamellated, &c.), this genus differs from *Homotrysis* (including *Hybrenia* and *Lisa*) by its totally different build, which is very exceptionally robust for the family, recalling somewhat the appearance of *Dascillus*; also by the extremely strong and abrupt elevation of the hind part of the prosternum, which is considerably more marked than in *Homotrysis tristis*, Germ., in the very much longer sulcus running inward from the apex on the underside of the femora, much shorter third joint of the antennæ, &c. From *Nocar* it differs, *inter alia*, by its much more robust and parallel form, the hind part of the prosternum very much more elevated, &c.; from *Scaletomerus* by the last of the characters just named, by greater robustness, very different apical joint of maxillary palpi, prothorax scarcely narrower than the elytra, &c.; and from all the above by its anterior tibiæ dilated externally at the apex, this latter character approximating the present genus to the Hawaiian *Labetis*, to which it really bears a good deal of resemblance, though differing in important characters (*e.g.*, the structure of the palpi and femoral sulci). The example before me has lamellæ on the third and fourth joints of the front tarsi and the fourth of the intermediate, but not a well-defined one on the hind tarsi.

B. robusta, sp. nov. Minus nitida; modice convexa; sat lata; sat parallela; sparsim breviter pubescens; obscure rufo-brunnea, metasterno medio picescente, antennis palpis pedibusque dilutioribus; capite brevi rugulose sat crasse punctulato; prothorace quam longiori fere duplo latiori, antice parum angustato, postice ante basin utrinque impresso, confertim aspere punctulato, lateribus sat rotundatis, angulis anticis nullis plane rotundatis, angulis posticis suberectis; elytris subfortiter minus crebre punctulatis, subtiliter striatis; sternis fortiter minus crebre (prosterni lateribus crasse rugulose), abdomine sparsim subtiliter, punctulatis.

Maris (?) antennis quam corporis dimidium longioribus. Long., 4 l.; lat., $1\frac{4}{5}$ l.

It is impossible to be certain that this may not be one of the numerous Australian species attributed to *Allecula*, and described in a few words, without reference to structural characters. The brief description of *A. Mastersi*, Macl., for example, might possibly be founded on it.

Queensland; sent by F. M. Bailey, Esq.

NOCAR (gen. nov.).

Caput antice sat breve; mandibulæ apice bifidæ; palporum maxillarium articulus secundus sat brevis; apicalis late, labialium minus late, triangularis; oculi magni modice approximati; antennæ sat graciles modice elongatæ, articulus 3^{us} quam 4^{us} vix longior; prothorax fortiter transversus, a basi antrorsum fortiter rotundatim angustatus, basi bisinuatus; corpus ovale, alatum; suturæ ventrales apicales 2 ad latera subito valde retrorsum directæ.

This new generic name is necessary to distinguish certain small *Cistelidæ* which agree with *Homotrysis* in the possession of wings, mandibles bifid at the apex, lamellated tarsi, widely triangular apical joint of maxillary palpi, &c., but differ very much in form, being oval, the four posterior femora scarcely long enough to extend laterally beyond the margin of the elytra. The eyes are larger and more approximate than in the typical *Homotrysis* (*H. tristis*, Germ.), the third joint of the antennæ is relatively shorter, the head is very much smaller in comparison of the other parts, being less than half as wide as the base of the prothorax; the general surface is only slightly nitid, and is clothed with very fine adpressed pubescence—not erect pilosity; and the apical ventral segment does not bear a fovea. Joints 3-11 of the antennæ are of very uniform length, joints 3 and 4 being only a little longer than the rest.

From *Allecula* and *Cistela* this genus is distinguished, *inter alia*,

by the comparatively approximate eyes (the interval between which is much less than the width of each eye as seen from above) and the strongly bisinuate base of the prothorax.

The species which I described as *Cistela australica* (Proc. L. Soc., N.S.W., 1888, p. 1,441), in the collection made in the N. Territory by Mr. J. P. Tepper, appears to belong to this genus, though its condition does not allow a very satisfactory examination of all details. The genus is very near *Cistela*, but I think the characters mentioned above (especially the first) together with the distinct lamella under the penultimate joint of each tarsus justify its separation.*

N. latus, sp. nov. Convexus; sat late ovalis; supra minus nitidus; pube fulva vestitus; obscure brunneus vel rufus, antennis palpis pedibusque plus minusve dilutioribus; capite prothoraceque confertim aspere sat fortiter punctulatis; hoc quam longiori vix duplo latiori, basi fortiter bisinuata quam margo anticus duplo latiori quam elytrorum basis haud angustiori, angulis posticis acutis leviter retrorsum directis; elytris sat crebre subfortiter punctulatis, punctulato-striatis, interstitiis subconvexis, lateribus sat arcuatis; corpore subtus nitido sparsim punctulato, exemplis nonnullis piceo-maculato. Maris oculis quam feminæ paullo magis approximatis. Long., $3\frac{1}{2}$ l.; lat. $1\frac{1}{2}$ l.

I judge from the brief description of *Allecula Mastersi*, Macl., that it is a member of this genus, and very nearly allied to this species. As, however, its habitat is very different (Gayndah, Qu.), and the description does not agree altogether with the S. Australian form (calling the pubescence "semi-erect," and the tarsi differently coloured from the tibiæ), I have little doubt of its distinctness.

S. Australia and Victoria; under bark of Eucalyptus.

N. debilis, sp. nov. Præcedenti valde affinis, sed minor, minus latus, antennis apicem versus infuscatis fere nigris, elytrorum striis apicem versus obsoletis; corpore subtus magis crebre magis fortiter punctulato. Long., $2\frac{3}{5}$ l.; lat., 1 l.

Certainly very close to *T. latus*, but the characters mentioned above, its uniformly smaller size, narrower form, elytral striæ almost entirely failing near the apex (in *T. latus* they are almost deeper near the apex than elsewhere), and the evidently stronger

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* Since writing the above I have examined the types of various *Cistelidæ* in the Macleay Museum. I find that *Cistela depressiuscula*, Macl., is certainly congeneric with my *Nocar latus* and is extremely close to it specifically. Unfortunately I had not an example of *N. latus* with me, so could not compare the two to determine whether they are specifically distinct.

and closer puncturation of the underside are evidently distinctive of a species.

S. Australia; Yorke's Peninsula, under bark of Eucalyptus.

N. simplex, sp. nov. *T. lato* affinis, sed minor, multo minus late (quam *T. debilis* minus late) ovalis, pedibus antennisque magis obscuris, oculis multo minus approximatis, elytris haud striatis, prosterni episternis fortiter rugulosis. Long., $2\frac{1}{5}$ l.; lat., $\frac{9}{10}$ l.

The distance between the eyes is a little greater than the width of either eye as seen from above (probably the eyes of the male are a little more approximated). The non-striated elytra (even the juxta-sutural stria being scarcely indicated) at once distinguish this species, which has a facies suggestive of *Choleva*.

S. Australia; taken by Mr. McDougal near Edithburgh.

SCALETOMERUS (gen. nov.).

Caput paullo elongatum; mandibulæ apice bifidæ; palporum maxillarium articulus secundus tertio sesquilongior apicali longitudine æqualis; hic sat late securiformis, labialium sat late triangularis; oculi maris modice feminæ parum approximati; antennæ modice robustæ, minus elongatæ, articulus 3^{us} quam 4^{us} longior; prothorax sat transversus, basi leviter bisinuata; corpus alatum minus elongatum; femora subtus sulco elongato impressa; suturæ ventrales apicales 2 valde impressæ ad latera subito valde retrorsum directæ; facie *Harpalides* simulans.

The apical joint of the maxillary palpi is elongate, but not nearly so narrow as that of *Anaxo*, the longest of its three sides being that which continues the external outline of the palpus. The resemblance to a *Harpalid* is very striking. The head is evidently more prolonged in a beak than that of *Nocar*.

S. harpaloides, sp. nov. Nitidus; modice elongatus; minus convexus; glaber; rufo-testaceus, elytris (sutura excepta) abdomineque infuscatis; capite prothoraceque subtilius minus crebre punctulatis; hoc quam longiori sesquilatiori, postice quam antice sat latiori, vix perspicue canaliculato, lateribus modice arcuatis, basi bisinuata, angulis posticis subacutis, retrorsum vix subproductis; elytris subtiliter striatis, striis sat subtiliter sat crebre punctulatis, interstitiis vix planis subtilius sparsim punctulatis; antennis elytrorum basin paullo superantibus; corpore subtus (præsertim abdomine) sublævigato.

Maris oculis sub approximatis; tibiis anticis intermediisque in medio intus sinuato-dilatatis; segmento ventrali apicali excavato. Long., 3 l.; lat., $1\frac{1}{5}$ l. (vix).

S. Australia; MacDonnell Ranges.

S. proximus, sp. nov. Præcedenti valde affinis; capite prothoraceque piceis, prothoracis angulis posticis paullo minus acutis; maris tibiis simplicibus, segmento apicali ventrali sat leviter impresso. Long., 3 l.; lat., 1¼ l. (vix).

The present species might well pass for a dark form of the preceding, were it not for the different male characters, which are almost confined to the somewhat closer approximation of the eyes, the tibiæ being quite like those of the female, and the apical ventral segment being only lightly impressed, instead of bearing a large deep round fovea.

S. Australia; basin of Lake Eyre.

HEMICISTELA (gen. nov. ? hujus fam.).

Caput sat breve; mandibulæ apice acuminatæ (?); palporum maxillarium articulus secundus robustus quam tertius paullo longior, apicali longitudine parum brevior; hic sat magnus securiformis, labialium obovatus, vix triangularis; oculi (maris ?) inter se sat distantes; antennæ modice robustæ quam corporis dimidium vix longiores, articulo 3° quam 4^{us} paullo breviori; prothorax sat transversus, quam elytra sat angustior, basi haud bisinuata; femora subtus sulco minus elongato impressa; tibiæ intermediæ (? maris solum) intus ante apicem emarginata; prosternum inter coxas haud elevatum, his illum sat fortiter superantibus; unguiculis vix manifeste pectinatis; corpus oblongo-ovale.

The species for which I propose this name is a very puzzling one which does not appear to me to fit quite satisfactorily into any known family. It has very decidedly the general appearance of a *Cistelid*, and I think the possession of the following characters in combination will justify its being placed among the *Cistelidæ*, viz., tarsi heteromerous, and furnished beneath with well-defined *lamellæ* (two on each of the four anterior, and one on the posterior), anterior coxal cavities closed behind. Nevertheless the claws are not distinctly pectinated within (under a microscope the inner outline seems to be finely crenulated), and the prosternal process, instead of being elevated to the level of the coxæ, passes between the coxæ on the general plane of the surface, the coxæ rising (but not very strongly) above its plane on either side. The apical spines of the tibiæ are very short and slender. The singular emargination of the intermediate tibiæ close to the apex of the inner margin is very likely to be sexual. The penultimate ventral segment is about the same size as that preceding it. The apical joint of the maxillary palpi is much like that of *Homotrysis tristis*, Germ., in shape, but is relatively smaller.

My unique type of this insect has its mandibles tightly closed together, so that I have been unable to examine them as exactly

as I could wish. I can only see *one* apical joint, but from the shortness of the head, and the evident resemblance in most characters to genera with bifid mandibles rather than to *Atractus* and its allies, I cannot help thinking it probable that this species really has bifid mandibles.

H. discoidalis, sp. nov. Subnitida; minus convexa; oblongo-ovalis; fere glabra; testacea, capite postice palporum apice antennis (basi excepta) prothoraceque rufo-infuscatis, elytris (plaga magna elongata discoidali utrinque livida excepta) abdominisque parte apicali nigris; capite prothoraceque subcoriaceis minus crebre leviter punctulatis; hoc sat transverso antice vix angustato, medio ante basin foveato; elytris punctulato-striatis, interstitiis sat planis sparsim sat fortiter punctulatis, striarum punctis quadratis sat crebris. Long., 2 l.; lat., $\frac{7}{10}$ l.

The livid patch on each elytron nearly reaches the base, but does not extend hindward much beyond the middle, and is somewhat narrowed from the base hindward. The size, color, and markings give this little species some resemblance to a *Lebiid (e.g., Ectroma civicum*, Newm.).

Victoria; Alpine district; a single example under bark.

PYTHIDÆ.

The genus characterised below as *Trichosalpingus*, though much like *Salpingus* in form, is really an extremely anomalous type which will not fit exactly into any family as characterised by M. Lacordaire. It agrees with the *Pythidæ* in the following characters:—Front coxæ contiguous, but little exserted and open behind, hind coxæ separated and strongly transverse, eyes lateral entire, pronotum much narrower than the elytra at its base, not separated from the flanks of the prosternum, prosternum truncate in front; but it differs in the structure of its tarsi, the penultimate joint of which is prolonged beneath the claw-joint, while the claws are strongly thickened at the base.

Some one or more of the above-mentioned characters are inconsistent with a place in any other of the known families of *Heteromera*.

TRICHOSALPINGUS (gen. nov.).

Mentum transversim subquadratum; palporum articulus ultimus ovalis; genæ (?) subtus spiniformes; oculi sat magni prominentes sat fortiter granulati; caput sat breve antice late breviter rostriforme (fere ut *Salpingi*); antennæ breves subfiliformes; prothorax sat quadratus; elytra sat elongata; pedes breves, femoribus tibiisque fere ut *Salpingi*; tarsi heteromeri, articulo penultimo subtus producto, posticorum

articulo 1° quam 4us sat longiori; unguiculi ad basin incrassati; prosterno antice truncato; corpus subtiliter pubescens.

T. brunneus, sp. nov. Oblongo-ovatus; minus nitidus; subtiliter pubescens; crebre (capite minus crebre subtiliter subaspere) punctulatus; obscure brunneus, capite prothorace antennis palpis pedibus abdomineque rufescentibus; antennis prothoracis basin vix attingentibus; prothorace quam caput vix latiori, sat transversim quadrato, ante basin utrinque fovea profunda impresso; elytris quam prothorax basi multo latioribus, a basi longe ultra medium leviter dilatatis. Long., 2 l.; lat., $\frac{3}{4}$ l.

Victoria; Alpine district.

NOTOSALPINGUS (gen. nov.).

Generi præcedenti differt genis haud spiniformibus, oculis multo minoribus, capite antice manifeste magis rostriformi, antennis apicem versus paullo incrassatis (nec clavatis), prothorace (speciei typicæ) cordiformi, tarsorum articulis (apicali excepto) brevibus, penultimo quam præcedentes multo angustiori haud subtus producto, articulis basalibus subtus hirsutis, corpore fere glabro capillis erectis sparsim vestito.

I think this genus will be sufficiently distinguished from those previously characterised in the family by its head resembling that of *Salpingus*, in combination with tarsi of which the apical joint is as long as all the rest together, the penultimate much narrower than the preceding joints, and the first not much longer than the second, and antennæ not clavate.

N. ornatus, sp. nov. Elongato-ovalis; sat nitidus; fortiter minus crebre (capite sat crebre) punctulatis; brunneus vix ænescens, piceo-umbratus, elytris testaceo-variegatis, palpis antennarum basi pedibusque plus minusve testaceis; prothorace transverso, ab apice retrorsum sinuatim angustato, lateribus sparsim obscure denticulatis; capite quam prothorax paullo, hoc quam elytra magis quam paullo, angustioribus. Long., $\frac{4}{5}$—$1\frac{1}{5}$ l.; lat., $\frac{3}{10}$—$\frac{4}{5}$ l.

The base of the prothorax is testaceous. The testaceous markings on the elytra consist of a wide vitta commencing on each shoulder and running towards the suture, which it nearly but not quite reaches at about a quarter the length of the latter from the scutellum; at that point it becomes much narrower, and continues parallel with the suture to about the middle of the length of the elytra, where it abruptly dilates and ends; there is also an indistinct testaceous blotch on each elytron near the apex. The above described testaceous markings are fairly

(in some examples very) well defined ; the rest of the surface has a mottled appearace owing to the brownish colour being here and there obscurely darker or lighter. The punctures on the elytra have a very evident tendency to run in rows.

The antennæ do not quite reach back to the base of the prothorax ; their joints do not differ much *inter se*, but the first four are evidently more slender than the rest, and the apical four or five again show a slight increase in stoutness.

S. Australia ; near Port Lincoln ; under bark of Eucalyptus.

NEOSALPINGUS (gen. nov.).

A. Trichosalpingo differt fere ut præcedens sed antennarum articuli ultimi 3 clavam abruptam formant.

This genus differs from *Notosalpingus* very much as *Lissodema* differs from *Salpingus;* from *Lissodema* it is at once separated by its very different tarsi, which are shorter and stouter, with the apical two joints conspicuously more slender than the rest, which are densely clothed beneath with long hairs, the basal joint of the hind tarsi being scarcely longer than the second.

N. corticalis, sp. nov. Oblongo-ovatus ; nitidus ; obscure viridi-æneus, corpore subtus piceo, antennarum basi palpis pedibusque rufis ; capite prothoraceque crebre subtilius punctulatis, puncturis obscure longitudinaliter strigatim positis ; prothorace leviter transverso, pone apicem rotundato dilatato, retrorsum sinuatim angustato, disco late longitudinaliter impresso, lateribus haud denticulatis ; elytris leviter striatis, striis sat subtiliter minus crebre (interstitiis hic illic sparsissime) punctulatis. Long., 1 l. ; lat., $\frac{2}{5}$ l.

The antennæ set back would about reach the base of the prothorax ; their club is very abrupt, the first two of its joints almost transverse, the third a trifle longer. The prothorax is punctured a trifle less finely and closely than the head ; its surface is noticeably uneven, having some obscure transverse impressions in addition to the longitudinal one ; near the base on either side is a little elevated pustule.

Superficially very like *Salpingus hybridus*, Er. (to which a specimen from Tasmania, given me by Mr. J. J. Walker, I have no doubt pertains) ; but the latter appears to be a genuine *Lissodema*, and also differs, *inter alia*, by its longer antennæ.

S. Australia ; under bark near Port Lincoln.

N. dentaticollis, sp. nov. Oblongo-ovatus ; nitidus ; obscure brunneus vel fere castaneus, vix æneseens, corpore subtus antennarum basi palpis pedibusque brunneo-testaceis ; capite subtilius, prothorace sat fortiter, crebrius punctulatis ; hoc sat transverso pone apicem sat dilatato, retrorsum

angustato, medio obscure impresso, lateribus sat fortiter sparsim denticulatis; elytris haud striatis minus fortiter sat crebre punctulatis, puncturis subseriatim positis. Long., $\frac{4}{5}$—$1\frac{1}{5}$ l.; lat., $\frac{3}{10}$—$\frac{3}{5}$ l.

Very distinct by the well-defined denticulations (about six in number) on each side of the prothorax. The antennæ seem a trifle longer than those of *N. corticalis*.

S. Australia; under bark near Port Lincoln.

LISSODEMA.

L. frigidum, sp. nov. Elongato-ovale; nitidum; obscure cupreo-æneum, antennarum basi palpis pebibusque testaceo-rufis; capite subtilius sat crebre, prothorace magis fortiter minus crebre, punctulatis; hoc vix transverso, obscure irregulariter impresso, pone apicem leviter dilatato-rotundato et retrorsum subsinuatim angustato, lateribus sparsim sat fortiter denticulatis; elytris leviter striatis striis subtilius minus confertim punctulatis, interstitiis sparsissime seriatim punctulatis. Long., 1 l.; lat., $\frac{2}{5}$ l.

The elongate slender tarsi of this species seem to forbid its generic association with any of those described above. I do not observe any character, however, inconsistent with a place in *Lissodema*. The denticulate sides of its prothorax will at once distinguish it from *L. hybridum*, Er.

Victoria; under bark on one of the higher mountains.

LAGRIIDÆ.

OMMATOPHORUS.

O. Mastersi, Macl. I have recently had the opportunity of examining the type of this species, and now (through the courtesy of Mr. Masters) possess an example. Sir W. Macleay was wrong in referring it to the *Lagriidæ* (he did so only with hesitation) as it is certainly a *Cistelid*. Its anterior coxal cavities are closed behind and its claws are strongly pectinated. It is extremely close to the species I have called "*Homotrysis rugulosa*, Boisd.?" (vide supra), scarcely differing from it except in the eyes of the male, being absolutely contiguous and the prothorax a little less sparsely and more strongly punctulate.

PEDILIDÆ.

MACRATRIA.

The following species seems to me capable of being referred to *Macratria* without being likely to cause confusion. M. Lacordaire places this genus in the *Pedilides*, which he separates from the *Anthicides* on the ground of their hind coxæ being contiguous or

nearly so, but later writers have found the distinction unworkable. From its reference by M. Lacordaire to *Pedilides* I presume that *Macratria* has the hind coxæ at least less separated than those of *Anthicus* (though the great French author does not categorically assert that they are), and since in the present insect they are little, if at all, less widely separated than in some *Anthici*, it seems probable that this insect might need to be regarded as representing a new genus very close to *Macratria*. But as I have not a type of *Macratria* for comparison it will be better to refer it to that genus, with which it agrees in its anterior coxal cavities open behind, in its elongate serrated maxillary palpi (of which the second and third joints are strongly and angularly produced on their inner side, the third very strongly transverse), and, in fact, in all the characters mentioned by M. Lacordaire, unless it be that specified above.

The Ven. Archdeacon King (Trans. Ent. Soc., N.S.W., II., p. 2) described an insect under the name *Macratria australis* from which the species before me seems to be very distinct, although I should judge from the description that it is congeneric; but on the other hand the venerable author states that his species resembles a *Dircœa*, a resemblance so improbable in a *Macratria*, that I cannot help thinking he meant to write that its *palpi* resembled those of *Dircæa*, to which, if it is a *Macratria*, no doubt they do bear some likeness, the serrated palpi being one of the most remarkable characters of the genus according to Lacordaire.

M. Victoriensis, sp. nov. Elongata; angusta; minus nitidas griseo-pubescens; nigra, elytris antennis palpis labro tibii; tarsisque castaneis; capite quam prothorax vixangustiori crebre subtilius punctulato; prothorace quam latiori sat longiori, retrorsum sat æqualiter arcuatim angustato, postice leviter canaliculato, confertim ruguloso; elytris coriaceis basi utrinque subgibbosis, quam prothorax sat latioribus, leviter striatis, striis leviter subcrasse punctulatis; antennis prothoracis basin vix attingentibus, articulis apicalibus 3 elongatis leviter incrassatis ultimo præcedentibus 2 conjunctis longitudine æquali.

Maris (?) abdominis segmento ventrali apicali fovea magna ovali instructo. Long., $1\frac{4}{5}$ l.; lat., $\frac{1}{2}$ l.

Victoria; Alpine district; on flowers.

ANTHICIDÆ.

It is with considerable hesitation that I refer to the *Anthicidæ* the very anomalous little insects which follow. Their facies is suggestive of *Xylophilus*, but the very distinct separation of

their hind coxæ forbids their being referred to the *Pedilidæ*. The remarkable tarsal structure may, perhaps, be thought equally inconsistent for an *Anthicid*, but I do not know any family of *Heteromera* with which it is not also inconsistent. The prosternum is excessively narrow (a mere line) in front of the front coxæ, which are widely open behind. As I have both sexes of the first species described, there is no doubt of its being genuinely heteromerous. If these insects had been before M. Lacordaire, when he wrote the "Genera des Coléoptères," I imagine he would have regarded them as belonging to a distinct family near the *Anthicidæ*.

I have before me six examples in all, which agree in the following principal characters :—Head not joined to prothorax by a distinct neck, eyes very coarsely granulated, pronotum not separated from flanks of prosternum by a distinct margin, anterior coxæ prominent, contiguous, nearly reaching the front of the prosternum, and widely open behind, hind coxæ not contiguous, tarsi heteromerous (the antepenultimate joint produced beneath in a kind of filament, the penultimate very small nodiform). These six examples pertain to five species, and it seems necessary to arrange the five species in three genera, in the first of which the eyes are very large, but not projecting much beyond the general contour of the head, and the intermediate tarsi long and slender ; in the second the eyes are much smaller and conspicuously prominent, while the intermediate tarsi are very much shorter and stouter ; and in the third the eyes are very prominent indeed, while the intermediate tarsi are almost as long and slender as in the first.

I presume these insects are rare, as the only examples I have seen referable to any of the genera are those described below.

SYZETON, gen. nov. (? hujus familiæ).

Palporum articulus apicalis late triangularis, maxillarium permagnus ; caput breve, prothoraci sat late applicatum ; oculi magni sat grosse granulati ; antennæ validæ filiformes ; prothorax transversus ad latera haud marginatus ; pedes sat elongati ; tarsorum articulus penultimus parvus nodiformis ; tarsi posteriores 4 quam tibiæ vix vel paullo longiores, horum articulus primus quam ceteri conjuncti vix brevior vel manifeste longior ; coxæ anticæ contiguæ prominentes postice apertæ, intermediæ posticæque modice approximatæ ; processus ventralis inter coxas acutus ; sutura ventralis prima in medio fere obliterata ; corpus alatum pubescens ; unguiculi simplices ; tibiarum apice vix spinoso.

S. lætus, sp. nov. Oblongo-ovalis ; subnitidus ; subtus pubescens ; supra pilis erectis vestitus ; subtus piceus, supra læte rufo-

testaceus, capite antennis et elytrorum fascia lata mediana apiceque nigropiceis, pedibus anticis rufis posterioribus piceis (coxis femorum basi tarsisque rufis); supra sat fortiter (capite prothoraceque quam elytra paullo minus fortiter) minus crebre punctulatus, capite prothoraceque (quam elytra sat angustioribus) inter se latitudine æqualibus; hoc transverso postice leviter angustato, lateribus vix arcuatis.

Maris segmento ventrali apicali fovea leviter impresso; tibiis anticis apice manifeste arcuatis; oculis supra sat approximatis. Long., 1 l.; lat., $\frac{3}{10}$ l.

The antennæ of the male are a little more than half the length of the body, stout, and of almost even thickness, the second joint small, the eleventh twice as long as the tenth, the rest about equal in length, *inter se*, none of them transverse; those of the female are a little less than half the length of the body, and are very stout, joints 4-11 of even width and considerably wider than the basal 3 joints, 4-10 all transverse, 11 considerably longer than 10. Joints 1 and 3 are evidently longer than 4-10, joint 2 is small. The basal joint of the hind tarsi is about half again as long as (and much stouter than) all the others together; that of the intermediate is about equal to the apical four joints together. The antepenultimate joint is considerably produced below the following joints but does not appear to be lamellated.

Victoria; Alpine district, on flowers.

S. lateralis, sp. nov. Ovalis; minus parallelus; subnitidus; subtus pubescens; supra pilis erectis vestitus; rufo-testaceus, antennis (basi apiceque exceptis) capite prothorace et elytrorum macula utrinque laterali (hac vix ante medium posita) piceo-nigris, geniculis vix infuscatis; supra sat fortiter (capite prothoraceque quam elytra paullo minus fortiter) sat crebre punctulatus; capite transversim subquadrato quam prothorax sublatiori; hoc transverso antice sat angusto mox pone apicem latiori, lateribus (parte antica excepta) fere parallelis; elytris quam caput sat latioribus.

Mas latet. Long., $1\frac{1}{2}$ l.; lat., $\frac{1}{2}$ l.

Apart from the difference in colour and markings, the present species differs from the preceding, *inter alia*, in the structure of the antennæ, the basal joints of which are not noticeably more slender than the rest, nor any of the joints except the tenth transverse, the second joint, moreover, being not very much smaller than the first and third. The antennæ are about as stout as those of *S. lætus* but a trifle longer; their testaceous apical joint is very conspicuous. My example of this species

seems to be a female, although its antennæ are more like those of the male of *S. latus*.

Victoria; Alpine district.

SYZETONINUS, gen. nov. (? hujus familiæ).

A genere *Syzeton* differt oculis minoribus magis prominentibus antennis magis gracilibus.

In other respects the characters mentioned above for *Syzeton* may be read as applying to this genus.

These characters may appear slight as generic, but the difference in the structure of the head and antennæ certainly seem to me more than specific. In *Syzeton* the eyes are extremely large, but are contained within the head (so to speak), the base of the head extending distinctly behind the eyes almost as far laterally as the widest part of the eyes, so that the head is subquadrate; in *Syzetonellus* and *Syzetoninus* the eyes are considerably smaller, but the base of the head does not extend laterally behind them, so that the head is not at all quadrate. This, together with the considerable antennal difference, gives the insects a very different facies. *Syzetoninus* differs from *Syzetonellus* in the intermediate tarsi being long and slender, like those of the hind legs, and in the less complete obliteration of the first ventral suture.

S. mundus, sp. nov. (Mas ?). Elongato-ovalis; vix nitidus; pilis brevibus adpressis minus confertim vestitus; subtus piceo-niger, capite nigro, prothorace rufo, elytris pallide testaceis macula communi basali triangulari fascia mediana undulata maculaque communi apicem insidenti piceis ornatis, antennis palpis pedibusque rufo-testaceis; capite prothoraceque sat crebre sat fortiter punctulatis; hoc transverso ante basin bifoveolato, lateribus sat arcuatis; elytris sat crebre minus fortiter punctulatis; femoribus posticis subtus dentatis. Long., 1 l.; lat., $\frac{3}{10}$ l.

The antennæ are not quite so long as half the body; they are nearly filiform, joints 1 and 2 a little stouter than the following ones, 3 quite small, 4 cylindric, 5-10 not differing much *inter se*, but gradually a little stouter, and a little more triangular in shape; 11 about twice as long as 10.

S. Australia; near Port Lincoln.

S. inconspicuus, sp. nov. (Mas.). Elongato-ovalis; subnitidus; pilis brevibus adpressis minus confertim vestitus; subtus piceo-niger, capite nigro, prothorace elytris antennarum basi pedibusque brunneis; supra sat crebre subfortiter punctulatus; prothorace quam caput angustiori, transverso, ante medium transversim canaliculato, ante basin fovea magna

arcuata impresso, postice vix angustato, lateribus vix arcuatis; elytris pone basin arcuatim impressis; segmento ventrali apicali leviter impresso. Long., $\frac{2}{3}$ l.; lat., $\frac{3}{10}$ l. (vix).

The antennæ are considerably more than half as long as the body; the basal two joints (which are of testaceous-brown colour) are a little stouter than the rest, the first much longer than the second; 3-7 are cylindric, slightly increasing in length (3 notably the smallest of them, but evidently longer than 2), 8-10 a little stouter than the preceding joints, but not longer; 11 a little longer and stouter. The incrassation of the antennæ towards their apex is very slight, and the only joint among the apical 6 or 7 that is at all markedly different from the rest is the eleventh.

S. Australia; near Port Lincoln; under bark of *Eucalyptus*.

SYZETONELLUS, gen. nov. (? hujus familiæ).

A genere præcedenti differt oculis multo minoribus magis prominentibus, antennis magis gracilibus, pedibus minus elongatis, tarsis intermediis quam tibia multo brevioribus (illorum articulo 1° quam ceteri conjuncti sat breviori), sutura prima ventralifere tota obliterata.

In all other respects the characters mentioned above for *Syzeton* may be read as applying to this genus.

S. alpicola, sp. nov. (Mas.) Ovalis; subnitidus; pilis brevibus adpressis minus confertim vestitus subtus niger, capite palpisque nigro-piceis, antennis pedibusque rufo-testaceis, prothorace rufo-piceo, elytris brunneo-testaceis apicem versus obscurioribus utrinque fascia lata mediana picea (suturam haud attingente) ornatis; supra sat crasse subcrebre punctulatus; capite quam prothorax, hoc quam elytra, sat angustioribus; prothorace vix transverso subquadrato, lateribus leviter arcuatis; femoribus posticis valde incrassatis; tibiis posticis fortiter compresso-dilatatis ante apicem externe emarginatis; metasterno utrinque tuberculo instructo. Long., $\frac{7}{10}$ l.; lat., $\frac{3}{10}$ l. (vix.).

The antennæ are slightly longer than half the body, and are moderately stout, the basal two joints scarcely different, *inter se*, stouter than the following ones, but scarcely longer, joints 3-6 cylindric, 7-10 obconic slightly stouter, 11 evidently stouter and longer than 10, pointed at the apex.

It is probable that the dilated hind femora (almost like those of a *Haltica*) and the compressed hind tibiæ as well as the tuberculate metasternum are peculiar to the male.

The black palpi, in contrast with the rufo-testaceous antennæ, furnish a conspicuous character.

Victoria; Alpine district.

MORDELLIDÆ.

MORDELLA.

M. Baldiensis, sp. nov. Nitida; nigra; supra, aureo, subtus argenteo, pubescens, prothorace et elytris subcœruleo-micantibus. Long., $1\frac{1}{2}$—$1\frac{3}{4}$ l.

This little species is entirely devoid of distinct markings, but the evenly-distributed pubescence has an appearance resembling a pattern which varies infinitely according to the way the light falls on it. If the insect be looked down upon from above there seems to be a line running from each shoulder to the suture at about a third of its length, and then continuing along the suture, and as the point of view is moved backward the lines from the shoulder seem to lengthen and meet the suture further from the base. From a certain point of view there seems to be a facia behind the middle, which seems to move its position as the point of view is shifted.

Victoria; on a mountain called Baldi; on flowers.

ŒDEMERIDÆ.

TRICHANANCA (gen. nov.).

Mentum antice acuminatum; palporum maxillarium articulus apicalis magnus late triangularis; labrum transversum antice subtruncatum; caput sat breve; oculi magni prominuli grosse granulati rotundati vix emarginati; antennæ prope oculos insertæ validæ minus elongatæ 11-articulatæ filiformes; prothorax cordiformis; elytra sat elongata; femora linearia sat elongata; tibiæ anticæ spinis singulis armatæ; tarsorum articulus penultimus, - anticorum articuli omnes,—subtus tomentosi, anticorum articulo basali intus valde dilatato; corpus pilis erectis vestitum.

The single spur of the front tibiæ will distinguish this genus from *Sessinia;* from *Nacerdes* (Ananca) it may be known, *inter alia*, by its round prominent coarsely-granulated eyes, and the erect pilosity with which it is clothed.

T. Victoriensis, sp. nov. Rufo-brunnea, corpore subtus pedibusque dilutioribus; supra pilis erectis vestita; nitida; crasse minus crebre punctulata, puncturis in elytris seriatim positis; prothorace (quam caput paullo latiori, quam elytra paullo angustiori) leviter transversus, pone apicem fortiter rotundato-dilatato, lateribus pone medium concavis fovea permagna utrinque posita. Long., $2\frac{1}{2}$ l.; lat., $\frac{7}{10}$ l.

The shape of the prothorax is unusual, the sides behind the middle being rendered deeply concave by the presence of a very large and deep fovea which interrupts the outline, being placed

in the declivous lateral portion of the segment. The antennæ set back reach a little beyond the base of the prothorax; they are very stout, the basal joint the stoutest, the second short, the third about twice as long as wide (equal in length to the first), the fourth a little shorter, the fifth and following joints (except the last, which is nearly twice as long) each about equal to the third.

I am doubtful of the sex of my example of this insect, but the long apical joint of the antennæ and the lobe-like production of the basal joint of the front tarsi on the inner side are perhaps likely to be characteristic of the male.

Victoria; Alpine district.

LONGICORNES.

PHACODES.

P. validus, sp. nov. Brunneus in partibus nonnullis cinereo-pubescens; prothorace sat transverso, sparsim æqualiter (nisi disco postice) granulato, disco postice spatiis nitidis subelevatis obscure notato, lateribus æqualiter sat fortiter rotundatis; elytris pone medium cinereo-fasciatis, apice spina elongata acuta armatis, sparsim sat æqualiter tuberculis parvis obtusis ornatis, antice fortiter rugulose postice minus perspicue punctulatis; antennis (maris?) quam corpus longioribus, subtus piloso-ciliatis, parte apicali rufescenti, articulo 3° quam 4^{us} fere dimidio longiori; pedibus cinereo-pubescentibus maculis parvis nudis ornatis; corpore subtus maculatim brunneo-cinereoque-pubescenti. Long., 13½ l.; lat., 3⅗ l.

A large and distinct species with a thin ashy pilosity over the whole upper surface; this ashy pilosity becomes in parts so dense as entirely to conceal the general sculpture (saving that the granules and tubercles protrude through it). The dense pubescence covers the head, the prothorax (except the hinder parts of the middle of the disc), the scutellum, the shoulders, and the apex of the elytra, and forms a transverse fascia a little behind the middle of the elytra; the pilosity near the hinder part of the lateral margin is also a little more dense than on the general surface, so that the fascia and apical pilosity are indistinctly connected laterally, and in that part the derm is of a somewhat reddish tone.

Compared with *P. obscurus*, Fab., this species is evidently larger and of stouter and more robust appearance, with much stouter antennæ (thin apical spines traceable quite to the eighth or ninth joint), densest parts of the pubescence much more dense, tubercles on elytra smaller and more numerous, apical spines of elytra very much longer and more developed, the third joint of

the antennæ very noticeably shorter in proportion to the fourth joint, &c., &c.

Queensland ; sent to me by F. M. Bailey, Esq.

P. bellus, sp. nov. Niger in partibus nonnullis dense albido-pubescens pedibus antennisque rufescentibus ; prothorace sat transverso, fortius rugulose punctulato, latera versus sparsim granulato, disco postice spatiis nitidis elevatis notato, lateribus paullo pone medium subangulatis, ante basin subsinuatis ; elytris antice fortitèr rugulose postice minus perspicue punctulatis, spatiis elevatis inæqualibus nonnullis permagnis) nitidis elevatis passim ornatis, apice emarginatis bispinosis, spinis externis elongatis acutis internis brevibus obtusis ; antennis maris quam corpus multo longioribus, subtus subtiliter piloso-ciliatis, a basi extrorsum gradatim rufescentibus, articulo 3° quam 4 ^{us} vix plus quam dimidio longiori ; pedibus albido-pubescentibus, maculis parvis nudis ornatis. Long., 8-12 l. ; lat., $2\frac{1}{5}$-$3\frac{1}{2}$ l.

The whitish-grey pubescence of the upper surface is dense and extensive enough to give the appearance of the general surface being almost white, the non-pubescent parts looking like black markings. The non-pubescent parts are mostly elevated, but the one of them that is largest in area (a wide ante-median fascia on the elytra, widest on the margin and much interrupted at the suture) is on the level of the general surface ; this non-pubescent part is coarsely rugulose, the rest being lævigate or nearly so. The elevated non-pubescent spots consist of a number of small granules protruding through the pubescence on the sides of the prothorax, a short longitudinal ridge on the middle line of the prothorax (entirely in the basal half), with an irregular, somewhat lunate ridge on either side of it (these lunate ridges longer than the central one and not quite glabrous), and a number of spaces on the elytra resembling obtuse feebly-elevated tubercles, some of those in the hinder half being very much larger in area than the rest, and having a diameter scarcely less than a third of the width of the elytron. As in the preceding species the derm near the apex has more or less tendency to a reddish tone of color. In the examples before me the pubescence on the head is patchy, and in parts thin ; this may be due to abrasion. Joints 3-7 of the antennæ are distinctly spined.

This species is at once distinguished from most of its congeners by the bi-spinose emargination of the apex of the elytra (though the *sutural* apex is an angle rather than a well-defined spine) ; and by the form of the prothorax, the sides being nearly straight from close behind the front to behind the middle, and then converging from a fairly well-defined angle somewhat sinuously to

the base. The two examples before me are of very different size but otherwise identical. They both seem to be males.

N. S Wales ; Richmond River district.

P. marmoratus, sp. nov. Brunneo-piceus, maculatim ochraceo-et albido-dense pubescens ; prothorace sat transverso, subtiliter sparsim granulato, indistincte ruguloso, spatiis 9 elevatis nitidis ornato, his pube densissima ochracea circumcinctis vel totis abditis, lateribus 2-tuberculatis et pone medium sinuatim convergentibus; elytris antice fortiter minus crebre postice leviter obscure punctulatis, postice spatiis parvis nitidis vix elevatis ornatis, apice oblique truncatis, truncatura externe spina valida armata ; antennis maris quam corpus sat longioribus, subtus piloso-ciliatis, articulo 3° quam 4^us^ paullo longiori ; pedibus albido-pubescentibus, maculis parvis nudis ornatis. Long., 11l. ; lat., $3\frac{1}{5}$ l.

A narrow elongate, somewhat frail-looking species for a *Phacodes;* extremely distinct by the dense ochraceous pubescence which forms conspicous markings on the head and prothorax. On the head it forms a ring round the eyes. The prothorax is very peculiarly sculptured ; the lævigate spaces (which are very strongly elevated) are—a short longitudinal space in the middle near the base, and eight tubercles arranged in two transverse rows, both of which are arched hindward, so that the two inner tubercles of each row are nearer the base than the external ones, which are placed very near each other (one in front of, the other slightly behind, the middle). The external tubercles are on the margin, and interrupt the lateral edges, which converge somewhat sinuously behind them. The inner tubercles are elongate, and placed obliquely, and are much larger than the external ones ; they are more or less surrounded with a dense ochraceous pubescence, which gives them an ocellated appearance. The external tubercles are completely buried in dense ochraceous pubescence. The general surface of the prothorax is very even, but bears some small sparse granules. The elytra are nearly five times as long as the prothorax; they are very evenly marbled with whitish and ochreous pubescence in patches, these patches not taking any very defined form ; in some places, however, the pale pubescence forms rings round dark glabrous spots, especially along the lateral edge, and from a certain point of view there seems to be traceable a continuous zigzagged whitish line running from the middle of the margin obliquely to the suture, following the suture nearly to the apex, and then returning sinuously up the disc. The single strong sharp spine in the middle of the apex of the elytra is a notable character. Joints 3-5 of the antennæ are spined.

Australia ; I am doubtful of the exact habitat.

ORCUS.

O. cælestis, Blackb. This name was accidentally printed "*O. cœlestris*" in Tr. Roy. Soc., 1891, p. 153, where the species is described.

EDUSA.

E. læta, Blackb. This name was accidentally printed "*E. lata*" in Tr. Roy. Soc., 1891, p. 148, where the species is described.

E. glabra, Blackb. In describing this species (*l.c.*, p. 152) I accidentally omitted to say that it is found in Queensland.

Description of a New Species of Fabularia.

By M. C. Schlumberger.

(Communicated by Walter Howchin, F.G.S.)

[Read October 6, 1891.]

Plate XIII., figs. 5-8.

A few months ago I received from Mr. Sherborn, of London, several Foraminifera discovered by Mr. Howchin* in the Miocene beds of Muddy Creek, Victoria. Two of them seemed to be *Biloculinæ* with large longitudinal costæ and a cribriform aperture. These characters were remarkable enough, inasmuch as all known species of *Biloculina*, except *B. comata*, Brady, are smooth, and have a single tooth in the oral aperture. It was an easy matter to mistake the generic relationships of the specimens, as they were much weathered. Happily, Mr. Howchin obtained other specimens and kindly forwarded them to me. They are true *Fabularia*, and their discovery in a fresh locality is of the greatest interest, as the genus is only known by a single species from the Eocene *(Calcaire grossier)* of Paris and Egypt.

Two of the five specimens sent are sufficiently complete to allow a recognition of the external characters, and furnish material for a good drawing. The other three were used for the execution of two transverse and a longitudinal section. They all belong to the Form B,† whilst the Form A remains to be dis-

* The objects referred to by Mr. Schlumberger are the same as were briefly noted by me in "The Foraminifera of the Older Tertiary of Muddy Creek" as *Biloculina species* (Trans. Roy. Soc. S. Aus., vol. XII., p. 1), and which at the time of publication had been mislaid after having been submitted to the late Dr. H. B. Brady. The weathered condition of the test, added to the extraordinary external resemblance which this interesting object bears to the genus *Biloculina*, misled Dr. Brady, as it did Mr. Schlumberger in the first instance, and it was only on my making a section of the object that its true generic relationship was made apparent.—W. Howchin.

† Interesting researches, bearing on the internal structure of the Foraminifera, made by the eminent specialists, MM. Munier-Chalmas and C. Schlumberger, have established the fact that many Foraminifera, notably Nummulites and the Miliolidæ, possess a dimorphic structure in their respective species. The dimorphism is of a similar kind in all the genera and species which exhibit the phenomenon, and determines the size and arrangement of the initial chambers. The authors referred to above distinguish the dimorphic types as Form A and Form B. The former possesses, relatively, a very large initial chamber, whilst in the latter the initial chamber is small, and is surrounded by numerous small and gradually enlarging chambers.—W. Howchin.

covered. It is probable that the disposition of the central chambers, which is characteristic of the latter form, will be found in the case of very small individuals, as occurs with the minute examples of *Fabularia discolithes*.

FAMILY MILIOLIDÆ.

Genus—FABULARIA, *Defrance*.

Fabularia Howchini, Schlumberger.

Form A.—Unknown.

Form B.—In a median transverse and transparent section of *Fabularia Howchini* of Form B we find in the middle an oval microsphæra surrounded by four little chambers (fig. 1).

Fig. 1. *Fabularia Howchini*, Schlumberger. Form B, central portion x 100 diam.

The chambers IV. to VII. constitute successive triloculine cycles, and the last (VII.) is the first biloculine chamber. All the next are disposed alternately on the two sides of the axis of the poles in the same plane of symmetry as in the *Biloculinæ*. The first seven chambers have thin walls, leaning only against the preceding. The wall of the chamber VIII. becomes larger and produces an internal rib, extending to the wall of the chamber VI., and thus dividing chamber VIII. into two longitudinal canals. The next chamber (IX.) is divided into three canals by two internal ribs, and we remark in the greatest of them the beginning of a third rib from the inner side.

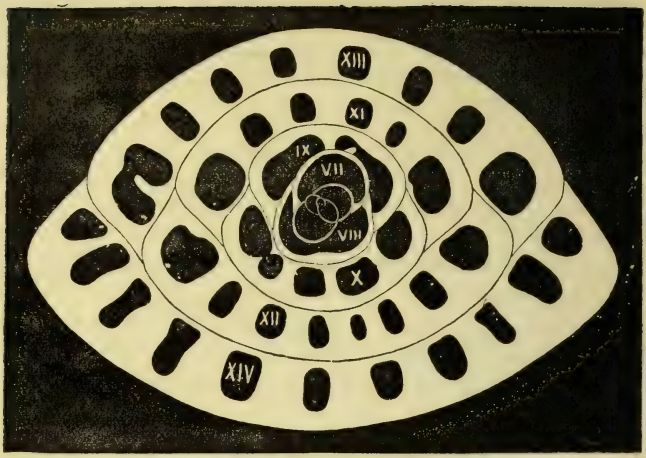

Fig. 2. *Fabularia Howchini*, Schlumberger. Form B, x 50 diam.*

The fig. 2 gives the reproduction of the complete medial section of a specimen of the Form B whose central chambers were partly destroyed. It will be seen that the successive chambers, increasing by external growth, are more and more divided into longitudinal canals by large ribs, whose calcareous deposit is extended over the outward face of the preceding chambers, so that each chamber becomes a complete investment, as in all the *Miliolidæ trematophoræ*.

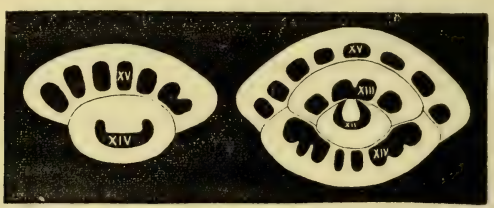

Fig. 3. Fig. 4.

Fabularia Howchini, Schlumberger. x 20 diam. Successive appearances of the preceding specimen, fig. 2.

The figs. 3 and 4 give the appearance of successive sections of the same specimen (fig. 2) taken, the former at the beginning of the operation, the latter at the quarter of the length. They show that the apertures of the chambers (XIV., fig. 3, and XIII.,

* During the preparation of this section the last chamber (XV.) was lost.

fig. 4) are occupied by a very large tooth. The superior part of this tooth divides itself in numerous ramifications, which also divide themselves and form the wall of the preceding chamber, thus constituting a trematophore with large openings.

From the comparison of the sections fig. 4 and fig. 2, it appears that the number of the canals increases towards the middle (in length) of the chambers, *i.e.*, the chamber XIII. (fig. 4) has only three canals, the middle beginning to divide ; on the median section (fig. 2) the same chamber is composed of eight canals, the one being nearly subdivided by an internal rib. A similar division is to be seen in one of the canals of chamber X. (fig. 2) by the formation of two opposite ribs, and it is therefore evident that the canals of the same chamber communicate with each other as in *Fabularia discolithes*.

Exterior characters (Plate XIII., figs. 5 to 8).—Plasmostracum free, with a regular ovoidal outline in breadth, compressed on the thickness, showing only two chambers, as in the true *Biloculinæ*. Test porcellanous, smooth, showing by transparency the disposition of the inner canals. Aperture formed by a small exhausted trematophore (fig. 8) with large perforations of various forms.

Dimensions of the figured specimen. — Length, 2mm., 7 ; breadth, 2mm., 8 ; thickness, 1mm., 2.

Locality.—The specimens which form the subject of the present note were found by Mr. Howchin in the Upper Division of the Muddy Creek Beds, Victoria, which I am informed Prof. R. Tate, of Adelaide, has referred to an age approximating to the Upper Eocene, or perhaps somewhat later.

Observation.—It is known that the chambers of *Fabularia discolithes*, Defrance, are composed of several rows of longitudinal canals of various dimensions, that the interior of the test is marked by numerous pits, and that the plasmostracum is compressed on the breadth whilst *Fabularia Howchini* has a smooth test, a single row of canals, and the compression of the plasmostracum is on the thickness.

DESCRIPTION OF PLATE XIII., figs. 5 to 8.

Fig. 5. *Fabularia Howchini*, Schlumberger. Lateral view of test. x 17 diam.
Fig. 6. " " Peripheral aspect of same specimen.
Fig. 7. " " End view showing aperture.
Fig. 8. " " Greatly enlarged view of aperture, exhibiting its cribriform character. x 40 diam.

The Foraminifera of the Older Tertiary (No. 2, Kent Town Bore, Adelaide).

By Walter Howchin, F.G.S.

[Read March 3, 1891.]

Plate XIII., figs. 11 to 13.

In 1881 a bore was put down in the Waterworks Yard, in the eastern suburb of Adelaide, under the control of the Hydraulic Department. Prof. R. Tate F.G.S. examined the cores as the work proceeded, and has described the section in detail. (Vide Trans. Roy. Soc., S.A., vol. V., p. 40). The first 69 feet of the section consists of Pliocene Drift, underlying which, in descending order, there follow about 290 feet of Lower Tertiary beds, the upper half of which are marine, and the lower lacustrine. The marine beds are fossiliferous at intervals throughout the section. The most important fossiliferous horizon occurs at the base of the marine rocks, the latter having the lithological features of brown and green clayey sands, 23 feet in thickness. It was from the examination of material from this bed that the following Foraminifera have been determined :—

FAMILY MILIOLIDÆ.

Genus—Biloculina, *d'Orbigny.*

1. *B. ringens*, Lamk. Sub-globose examples, such as Reuss has named *B. turgida*, but has not the value of a varietal distinction. Rare.

Genus—Miliolina, *Williamson.*

2. *M. trigonula*, Lamk. Rare.
3. *M. oblonga*, Montag. Large examples, some with produced neck. Rather scarce.
4. *M. seminulum*, Linn. Rather scarce.
5. *M. Ferussacii*, d'Orb. Compressed and starved examples. Rather scarce.

Genus—Cornuspira, *Schultze.*

6. *C. involvens*, Rss. Rather scarce.

FAMILY LITUOLIDÆ.

Genus—Haplophragmium, *Reuss.*

7. *H. agglutinans*, d'Orb. The few examples obtained of this species show a considerable range as to texture. The larger

examples are coarsely arenaceous, whilst the smaller specimens are smoother, with larger proportion of cement, and more distinct septation. Rare.

Genus—Textularia, *Defrance.*

8. *T. gibbosa*, d'Orb. Rare.
9. *T. agglutinans*, d'Orb. Moderately common.

Genus—Gaudryina, *d'Orbigny.*

10. *G. rugosa*, d'Orb. Rare.

Genus—Bulimina, *d'Orbigny.*

11. *B. pupoides*, d'Orb. A few fine examples.
12. *B. pyrula*, d'Orb. Moderately common.

Genus—Bolivina, *d'Orbigny.*

13. *B. punctata*, d'Orb. Rare.

Genus—Cassidulina, *d'Orbigny.*

14. *C. subglobosa*, Br. Small examples, and rather scarce.

FAMILY LAGENIDÆ.

Genus—Lagena, *Walker* and *Jacob.*

15. *L. lævis*, Montag. Rare.
16. *L. sulcata*, W. and J. Rare.
17. *L. squamosa*, Montag. Rare.
18. *L. hexagona*, Will. Rare.
19. *L. marginata*, W. and B. Rare.

Genus—Nodosaria, *Lamarck.*

20. *N. (Dentalina) soluta*, Rss. Rather scarce.
21. *N.* " *obliqua*, Linné. Rare.
22. *N. scalaris*, Batsch. Rare, but includes one large example of six segments.
23. *N. verruculosa*, Neugeb. One example of four segments. Not very characteristic, as the costæ are serrate rather than tuberculated.

Genus—Vaginulina, *d'Orbigny.*

24. *V. legumen*, Linné. Rare.

Genus—Cristellaria, *Lamarck.*

25. *C. cultrata*, Mont. Rare.

Genus—Polymorphina, *d'Orbigny.*

26. *P. gibba*, d'Orb. Common, often with tubulose growths.
27. *P. regina*, Br., P., and J. Rare.

28. *P. lactea*, W. and J. Rare.
29. *P. communis*, d'Orb. Rare.
30. *P. elegantissima*, P. and J. Moderately common.

Genus—Uvigerina, *d'Orbigny.*

31. *U. angulosa*, Will. A few very small examples.

FAMILY GLOBIGERINIDÆ.

Genus—Pullenia, *Parker* and *Jones.*

32. *P. sphæroides*, d'Orbigny. Rare.
33. *P. quinqueloba*, Reuss. Rare.

FAMILY ROTALIDÆ.

Genus—Spirillina, *Ehrenberg.*

34. *S. decorata*, Brady. In the paper on the "Muddy Creek Foraminifera" (Trans. R. Soc., S. Aus., vol. XII., p. 11), I have pointed out the slight variation which this species, as well as the next described, exhibits from the recent forms obtained from the Challenger material. The Kent Town examples possess the same varietal features as those obtained from Muddy Creek, but are in much greater numbers than in the latter district. Moderately common.
35. *S. tuberculata*, Brady. Moderately common.

Genus—Discorbina, *Parker* and *Jones.*

36. *D. globularis*, d'Orb. Rare.
37. *D. biconcava*, Parker and Jones. Rare.

Genus—Planorbulina, *d'Orbigny.*

38. *P. mediterranensis*, d'Orb. Rare.
39. *P. (?) acervalis*, Brady. A single example of very irregular acervaline growth. It does not conform to the usual character of this species, but may be only an aberrant growth.

Genus—Truncatulina, *d'Orbigny.*

40. *T. lobatula*, W. and J. Rather scarce.
41. *T. Ungeriana*, d'Orb. One of the commonest species of the material.
42. *T. margaritifera*, Br., var. *Adelaidensis*, var. nov., pl. xiii., figs. 11-13. Test rotaliform, much compressed laterally, consisting of 2-3 convolutions, and about twelve chambers in all. Superior surface nearly flat. Inferior surface slightly convex. Sutural lines depressed, and on superior surface strongly curved. On the inferior side the septation is marked by irregular depressed lines, enclosing

inflated raised areas. Peripheral margin sharp and sometimes furnished with a keel of considerable extent. Primordial region umbonate on superior surface, a feature which in very thin examples is visible on inferior side as well as superior. Surface of test ornamented on both sides (with the exception of final segment) by thickly set minute tubercles. Diameter, $\frac{1}{25}$ in.

This variety is distinguishable from the type by its greater lateral compression, fewer chambers, irregular septation on inferior surface, umbonate features of early chambers, and the general distribution of ornamentation on both faces. It is moderately common in the material from the Adelaide Bore, and is one of the most interesting species of the section. The "Challenger" localities for the species were Phillippine Islands, New Hebrides, and coast of the Korea.

Genus—Anomalina, *d'Orbigny.*

43. *A. ammonoides*, Reuss. Rare.

Genus—Pulvinulina, *Parker* and *Jones.*

44. *P. Hauerii*, d'Orb. Rare.
45. *P. repanda*, F. and M. Rare.

Genus—Rotalia, *Lamarck.*

46. *R. Soldanii*, d'Orb. Rare.

The Foraminifera, as determined from the material examined, have been referred to 46 species, belonging to 23 genera, and includes one variety not hitherto described. The Foraminifera as a whole bear a striking resemblance to those found in the Lower Bed of the Muddy Creek section, Victoria (*vide* Trans. Roy. Soc. S. Aus., vol. XII., p. 1), there being no less than 35 species common to the two localities, whilst only 11 are found in the Kent Town material which are unrecorded from Muddy Creek. It is also interesting to note that of the 35 species referred to, 16 are common to both the Upper and Lower Beds of Muddy Creek, whilst the remaining 19 are found in the Lower Bed only. The importance of the last mentioned fact will be understood when it is stated, that whilst 19 species distinctive of the Lower Bed are found in the Kent Town material, not one of the species limited to the Upper Bed of Muddy Creek has been detected in the Kent Town Bore. The palæontological evidence is therefore very definite in leading us to assign a geological age to the marine beds of the Kent Town Bore closely synchronous with those of the Inferior Beds of Muddy Creek, which, as determined by Prof. Tate from the higher organisms, must be low down in the Tertiary series. The remarkable affinities which the foraminiferal fauna exhibit to the Lower as compared with the

Upper portions of the Muddy Creek Beds gives independent confirmation of the conclusions already reached from their dissimilar fossil contents of a well-marked unconformability existing in the Tertiaries of Western Victoria.

General Microzoa.—The following were observed in course of examination of material, viz. :—Several species of Entomostraca, otolites, small fish bones, and a few straight and rough arenaceous tubes of doubtful affinities.

DESCRIPTION OF PLATE XIII., figs. 11 to 13.

Figs. 11-13. *Truncatulina margaritifera* var. *Adelaidensis*, Howchin.
Fig. 11. Lateral view of superior surface of test. x 36 diam.
Fig. 13. Lateral view of inferior side, showing oral aperture somewhat broken.
Fig. 12. Peripheral aspect, showing the compressed features of the test oral aperture aud biconvex outline of the primordial region.

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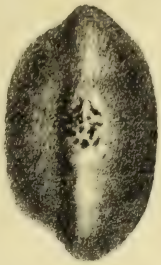
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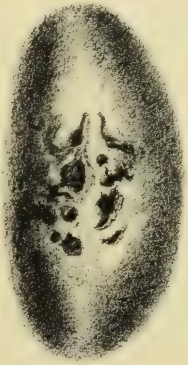
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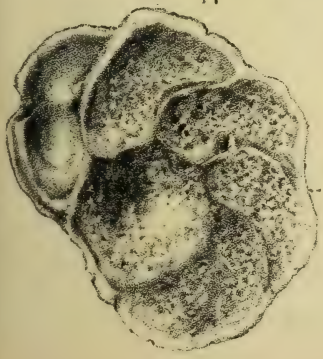
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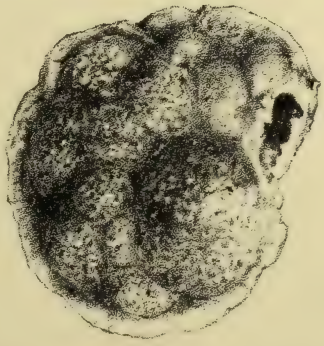
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The Foraminifera of the Older Tertiary, Muddy Creek, Victoria — Addenda et Corrigenda.

By Walter Howchin, F.G.S.

[Read March 3, 1891.]

Plate XIII., figs. 9, 10.

In the paper published on the above subject (Trans. Roy. Soc., S. Aus., vol. XII., p. 10) it was stated that a very fine example of what was undoubtedly a new species of *Rhabdogonium* had been obtained from the Upper Bed of the Muddy Creek section, but as it was mislaid at the time of publication it could not be described. It has since been found, and I now submit the following description.

FAMILY LAGENIDÆ.

Genus—Rhabdogonium, *Reuss.*

Rhabdogonium exsculptum, *sp. nov.* Plate xiii., figs. 9-10.

Test elongate, straight, tapering towards either extremity; triangular in transverse section, exhibiting three very strong longitudinal ridges, separated by deep grooves; ridges blunt, and quadrate on their outer faces. Longitudinal grooves deep, penetrating nearly to the centre of the test. Septal lines flush, straight, and very numerous. Aperture, a circular mouth at end of produced neck. Length, $\frac{1}{10}$ in.

This is a somewhat remarkable form. Its nearest ally is *R. tricarinatum*, d'Orb., but can be readily distinguished from that species by its three conspicuous keels or ridges, which practically compose the whole of the shell, and also by the greater number of its chambers. It is apparently restricted to the Upper Bed of the Muddy Creek (? Miocene) section, in which it is rare.

DESCRIPTION OF PLATE XIII., figs. 5-10.

Figs. 5-8. *Fabularia Howchini*, Schlumberger. For descriptiont see p. 346. of present volume. Upper Bed, Muddy Creek.

Fig. 9. *Rhabdogonium exsculptum*, Howchin. Lateral view, showing deep groove. x 20 diam. Upper Bed, Muddy Creek.

Fig. 10. *Rhabdogonium exsculptum*, Howchin. Transverse section of test.

By a clerical oversight the following species were omitted from the list of Foraminifera as published *loc. cit.*, p. 16, from the Upper Bed at Muddy Creek :—

Genus—Polystomella, *Lamarck.*

181*a*. †*P. striato-punctata*, F. v. M. Rare.
181*b*. †*P. subnodosa*, Münster. Common.
181*c*. †*P. crispa*, Linn. Rather scarce.

Mr. Sherborn, of London, has kindly drawn my attention to the fact that *Orbitoides stellata*, described and figured by me in *loc. cit.*, p. 17, pl. i., figs. 9-11, has been described by d'Archiac in Mém. Soc., Géol., France, ser. 2, vol. XI., plate vii., fig. 1, and, by a curious coincidence, under the same specific name. D'Archiac's specimens were from the Tertiary of Les Corbières. Hantken has also obtained the same form from the Tertiaries of Hungary.

ABSTRACT OF PROCEEDINGS

OF THE

Royal Society of South Australia,

FOR 1890-91.

ORDINARY MEETING, NOVEMBER 4, 1890.

WALTER HOWCHIN, F.G.S. (Vice-President), in the chair.

PAPER.—"On the Geological Structure of the Adelaide Plains, with special reference to the Croydon Bore and the so-called Coal Discoveries at Adelaide," by Prof. RALPH TATE, F.G.S., F.L.S., &c., &c.

ORDINARY MEETING, DECEMBER 2, 1890.

Rev. THOMAS BLACKBURN, B.A. (President), in the chair.

EXHIBITS.—A. ZIETZ, Assistant Director of the S.A. Museum, showed marine specimens taken from the Port Darwin telegraph cable at the site of its fracture, near the coast of Java, namely, a stalked feathered-starfish *(Pentacrinus)*, 2 species of free feathered-starfish *(Comatula)*, 2 large brittle starfish, and a number of *Cirripedia* of deep-sea forms. Also 8 species of crustaceans, of which several are probably new to science.

MOTIONS.—It was moved that a grant of money be made towards defraying the expenses of the proposed Antarctic Expedition. The motion was lost, but at the same time the Council was desired to inform the Committee of the expedition that, whilst fully sympathising with the scientific objects in view, the Society did not feel justified in granting any sum of money, as it had various important claims upon it connected with South Australia. Prof. TATE moved and Prof. RENNIE seconded and it was unanimously carried—"That this meeting learns with deep regret the loss sustained by the Linnean Society of New South Wales and science in general by the death of its President (Prof. W. J. Stephens)." It was moved and carried—"That it be a recommendation to the Council to solicit from Mr. James Parkinson a paper detailing his important geological discoveries in the neighbourhood of Leigh's Creek."

PAPERS.—"The Cryptogamic Flora of South Australia," by Prof. LUDWIG, Ph.D. "The Grammar and Vocabulary of a Tribe of Natives Inhabiting Central Australia, between the Finke River and Alice Springs," by Rev. H. KEMPE. "Remarks on Plants in South Australia very probably aiding in the Propagation and Perpetuation of the Red Rust *(Puccinea rubigovera)*," by J. G. O. TEPPER, F.L.S. "Description of a New Species of Cossus," by J. G. O. TEPPER, F.L.S.

ORDINARY MEETING, FEBRUARY 3, 1891.

Rev. THOMAS BLACKBURN, B.A. (President), in the chair.

BALLOT.—Ernest C. Saunders and Edwin Ashby were elected Fellows.

EXHIBITS.—W. HOWCHIN, F.G.S., exhibited an extensive collection of Celts or stone hatchets from Great Britain, Denmark, India, and Australia. Also a carbonaceous shale, of Archæan age, from near the Burra, of a black colour, which, on exposure to heat, turns white and loses 18 per cent. of its weight. J. J. EAST, F.G.S., showed specimens of *serpentine* from the Monarch Mine, near Caroona, Lake Gillies; it was supposed to contain nickel, but the blowpipe test did not reveal that metal. Also a specimen of *emery*, found recently in the Mount Lofty Ranges. J. G. O. TEPPER, F.L.S., exhibited the fruits of *Adamsonia*, from Western Australia, forwarded by his son. Also a specimen of a New Zealand edible fungus *(Hirneola polytricha)*, growing abundantly about Auckland, chiefly on the decaying wood of *Corynocarpus lævigatus* and *Melicytus ramiflorus*, forwarded by Allan Wight, of Pæraa. A. ZIETZ, Assistant-Director of the S.A. Museum, showed a number of native spear-heads, made from various materials, some elaborately carved. D. B. ADAMSON exhibited photographs of the recent solar eclipse.

PAPER.—"Coast Limestones of Fremantle, Western Australia," by Rev. J. G. NICOLAY.

ORDINARY MEETING, MARCH 3, 1891.

Rev. THOMAS BLACKBURN, B.A. (President), in the chair.

BALLOT.—Walter Gill, F.L.S., Conservator of Forests; W. H. Selway, jun., and Dr. J. Johnson, F.R.C.S. (Eng.), were elected Fellows of the Society.

MOTION.—A communication received from the Hon. Secretary (A. E. McDonald, Esq.) of the Royal Geographical Society of Australasia (Victorian Branch) was read, to the effect that "at a meeting of the Antarctic Committee, February 24, 1891,

Captain Pascoe, R.N. (President), was deputed to interview the Melbourne delegates to the Sydney Federal Convention. Will you take immediate steps and urge your representatives to give cordial support to the movement?" It was moved and decided to give the movement the hearty and moral support of the Society, and to telegraph to the Premier (Hon. Thomas Playford), requesting him to recommend the matter for the consideration of the Federal Council.

Exhibits.—J. G. O. Tepper, F.L.S., laid on the table two old and rare books—*(a)* "Philosophic Transactions of the Royal Society, London," 1684; *(b)* Swartz's "Observationis Botanicæ," 1791. Also some red earth from Roebuck Bay, Western Australia, eaten by the natives there, not from necessity, but as an article of their diet. Also the fruits of *Citrus australasica*, from Cooper's Creek, and *Capparis Mitchelli*. Also several insects, *e.g.*, a wasp with a spider it had caught, forwarded by Mr. Stacey; a specimen of *Perga affinis* and its larvæ; and a nocturnal moth with its underground cell, in which the pupa was lodged. A. Zietz, Assistant-Director of the Museum, exhibited some snakes from Central Australia, forwarded by Rev. H. Kempe (Correspond. Memb.), viz.:—Skin of an enormous poisonous snake, nine feet in length, belonging to the genus *Tropidechys*, sp. nov.; a specimen of the genus *Hoplocephalus*, sp. nov.; and specimens of *Furina Ramsayi* and *Vermicella Bertholdi*. Also, a species of perch from the R. Finke; and a sample of white chalky earth.

Papers.—"Description of *Notoryctes typhlops*," by E. L. Stirling, M.D., F.R.C.S. Eng. "Foraminifera of the Older Tertiaries, Part II. (Kent Town Bore)," by W. Howchin, F.G.S

Ordinary Meeting, April 7, 1891.

Prof. Ralph Tate (Vice-President) in the chair.

Exhibits.—J. G. O. Tepper, F.L.S., showed specimens of *Postrychus Jesuitica* from Port Pirie district, where it was attacking species of Acacia. Also some rock specimens from the neighbourhood of Lyndoch. J. C. F. Johnson, M.P., forwarded specimens of beetles from Western Australia, some of which Mr. Tepper thought were new. A. Zietz, Assistant-Director of the S.A. Museum, showed specimens of mollusca inhabiting the open sea, *e.g.*, a species of *Pteropoda*, two species of *Heteropoda*, and one of *Nudibranchiata*. Also species of *Salpa*, *Pyrosoma*, *Porpita*, and *Diphysiopsis*. Of vermes, a species of *Sagitta*. Also a series of larval stages of the higher crustacea. And several species of fish, one being a species

of *Scopelus*, showing the lateral luminous organs. Walter Howchin, F.G.S., exhibited some Foraminifera that were rock-builders. One sample, *Orbitoides Mantelli*, was from the Eocene-beds of Victoria. O. B. Lower forwarded a specimen of the leaf-butterfly from the Khasia Hills, India.

Notifications.—Prof. Tate referred to a recent visit to the glaciated surface at Hallett's Cove with Mr. Robert Jack, Government Geologist for Queensland, who, after examination of the surface, concluded that the ice had travelled northward. A. Zietz drew attention to the occurrence of *Perameles Gunnii* (the soft-furred bandicoot) in South Australia. The specimens were obtained by Mr. Scriven, near Border Town. The habitats previously given of the marsupial were Tasmania and Victoria, on the authority of Mr. Oldfield Thomas, of the British Museum. Mr. Zietz referred to an evident misprint in the Catalogue-description, which should read "tail only dark above its base for one inch."

Papers.—"Habits and Customs of the Aborigines about the R. Finke, Central Australia," by Rev. Louis Schulze. "Description of New Coleoptera," by Rev. Thomas Blackburn, B.A.

Ordinary Meeting, May 5, 1891.

Rev. Thomas Blackburn, B.A. (President), in the chair.

Motion.—It was moved and carried—"That in the opinion of the Society, it is highly expedient that the Director of the Botanic Gardens, Adelaide, should be a botanist of high standing and attainments." It was also decided that the Chief Secretary be interviewed on the subject.

Exhibits.—Prof. Tate, F.G.S., showed coloured photographs of glaciers. Also a collection of rare species of *Cypræa* from Eocene strata of South Australia and Victoria. A. Zietz, Assistant-Director of the S.A. Museum, exhibited a large collection of weapons, charms, &c., used by the aborigines of Finke River district. Charles Chewings, F.R.G.S., showed rock-specimens and fossils from the southern flanks of the MacDonnell Ranges. The fossils were in an excellent state of preservation, and comprised, amongst others, an *Orthoceras*, a *Raphistoma*, one or more species of *Leptæna*, and the tail of a large trilobite (*Phacops*, sp. ?). The facies was that of an Upper Silurian fauna.

Paper.—An abstract was read from Mr. Schulze's paper submitted at the last meeting.

Ordinary Meeting, June 2, 1891.

Rev. Thomas Blackburn, B.A. (President), in the chair.

Vote of Thanks.—J. G. O. Tepper, F.L.S., and W. L. Cleland, M.B. (Hon. Sec.), were thanked for having prepared the abstract of Mr. Schulze's paper read at last meeting.

Exhibits.—A. Zietz, Assistant-Director S.A. Museum, showed a number of boomerangs, curiously carved, which had been forwarded to the Museum from the Elder Exploring Party. O. W. Lower forwarded two species of moth, namely *Sphinx roseomaculata* and *S. distincta.*

Papers.—"Geological Notes on the Upper Finke River Basin," by Charles Chewings. "Descriptions of New Australian Lepidoptera," by E. Meyrick, M.A.

Ordinary Meeting, July 7, 1891.

Rev. Thomas Blackburn, B.A. (President), in the chair.

Vote of Condolence.—The President reported the death of D. B. Adamson since last meeting. It was unanimously resolved that a letter of condolence and sympathy be sent to the widow expressing the loss felt by the Society in his death.

Exhibits.—A. Zietz, Assistant-Director of the S.A. Museum, exhibited the birds collected by Dr. Stirling during his transcontinental trip with Lord Kintore through Central Australia. O. B. Lower forwarded specimens of *Charaxis Berenice*, or parrot butterfly, from Accra, Gold Coast, Africa.

Paper.—"Plants collected by Dr. Stirling in Central Australia," by Prof. Tate.

Ordinary Meeting, August, 4 1891.

Rev. Thomas Blackburn, B.A. (President), in the chair.

Ballot.—A. F. Calvert was elected a Fellow of the Society.

Vacancy in the Council.—W. B. Poole was elected to fill the vacancy in the Council caused by the death of D. B. Adamson.

Exhibits.—A. Zietz, Assistant-Director of the S.A. Museum, exhibited a collection of turtles and tortoises from the Northern Territory. W. Howchin, F.G.S., referred to the recent find of a *Diprotodon* skull at Gawler, together with other bones. J. J. East, F.G.S., showed an obsidian bomb of large size.

Papers.—"On a Subterranean Water-supply to Broken Hill," by Samuel Dixon; "Analysis of Volcanic Ash from Tanna, New Hebrides," by Prof. Rennie, D.Sc.

Ordinary Meeting, September 8, 1891.

Rev. Thomas Blackburn, B.A. (President), in the chair.

Ballot.—R. S. Rogers, M.D., was elected a Fellow of the Society.

Auditor.—D. J. Adcock was elected auditor of the current year's accounts.

Exhibits.—O. B. Lower exhibited two foreign butterflies. J. G. O. Tepper, F.L.S., showed an insect that had been caught in a crack of Miocene clay, which on becoming moist had expanded and thus imprisoned and pressed the insect. Prof. Tate drew attention to how such an object occurring in a fossilised condition might lead to an erroneous conclusion unless carefully observed. In such a case the object would be more or less perpendicular to the deposit instead of being horizontal to it.

Vote of Condolence.—It was decided to send a letter of condolence to the widow of the late L. S. Wilkinson, Government Geologist for New South Wales, on the loss she had sustained, and expressing the regret felt by the Society.

Papers.—"New Mollusca," by Professor Tate. "Second Supplement to S.A. Bivalves," by Prof. Tate. "Notes on *Emydura latisternum* occurring in South Australia," by A. Zietz. In addition to the previously-known occurrences of *Chelodina longicollis*, in the River Murray and its tributaries, and *Chelymys Macquaria*, in Lake Alexandrina, Mr. A. Zietz records *Emydura latisternum* from the Mount Gambier lakes and the River Torrens, the latter locality from a capture made about 20 years ago, the former more recently. Hitherto the species has been known as inhabiting Queensland only.

Annual Meeting, October 6, 1891.

Rev. Thomas Blackburn, B.A., in the chair.

Reports.—The annual report and balance-sheet of the Society were read and adopted. The annual reports and balance-sheets of the Field Naturalist and Microscopical Sections were accepted.

Election of Council.—The Council for the ensuing year was elected as follows:—President, Rev. Thomas Blackburn, B.A.; Vice-Presidents, Prof. Tate, F.G.S., F.L.S., and Samuel Dixon; Hon. Treasurer, Walter Rutt, C.E.; Hon. Secretary, W. L. Cleland, M.B.; Members of Council, Prof. Rennie, D.Sc., E. C. Stirling, M.D., Walter Howchin, F.G.S., W. B. Poole, Maurice Holtze, F.L.S., and J. S. Lloyd.

Vote of Thanks.—It was moved and carried that a special vote of thanks be passed to the following Fellows for their services on

the Council during the past year, namely, Prof. Tate, as Editor; Walter Rutt, C.E., as Treasurer; and W. L. Cleland, M.B., as Secretary.

President's Address.—The President (Rev. Thomas Blackburn, B.A.) then read his presidential address. It was carried unanimously that the address be printed.

Papers.—"Coleoptera of Australia," by Rev. Thomas Blackburn, B.A. "Critical Remarks on Described Species of Australian Tertiary Echinoidea," by Prof. Tate, F.G.S., &c., &c. "Further Notes on Habits and Anatomy of *Notoryctes typhlops*," by Dr. Stirling. "Description of a New Foraminifer," by Mons. Schlumberger.

ANNUAL REPORT.

The Council has the pleasure of reporting that the work of the Society has been carried on successfully during the past year; and congratulates the Fellows and Members upon again meeting in a room entirely devoted to the use of the Society and its Sections, and excellently adapted for that purpose. It may be mentioned that the room was first used by the Society for its annual meeting on August 29th, 1860.

An interesting feature of the exhibits has been the showing of the recent accessions to the Museum collected by Dr. Stirling during his trans-continental trip with His Excellency the Governor, Lord Kintore, full catalogues of which have now been completed by Mr. A. Zietz, the Assistant-Director of the Museum.

During the past year seven Fellows have been elected, and one Corresponding Member transferred to the list of Fellows.

The Council has again the melancholy duty of reporting the death of three of the Fellows of the Society, namely F. S. Crawford, Dr. R. Schomburgk, and D. B. Adamson.

Frazer S. Crawford, who was elected a Fellow in 1865, was known chiefly for his study of the various parasites affecting fruits and cereals, and for his attempts to obtain reliable prophylactics for the same. As his labours assumed, to a very large extent, a practical turn, and were not directed so much to the discovery of new scientific facts of an exact nature as to affording useful information to the cultivators, his contributions to the Transactions of the Society were but scanty, and afforded no index of his untiring industry in his particular line of scientific work. Hence, his reputation as a scientist was more appreciated by Agricultural and Horticultural Societies, and by co-workers in the same field in different parts of the world, with whom he was a valued correspondent, than by this particular Society. His contributions consisted of papers "On the Apricot Disease" and "Notes on Certain Pores on the Veins of some Diptera."

Richard Schomburgk, Ph.D., was elected a Fellow of the Society in 1865, and was for many years an active member. Since 1878, when he read a paper on "Vegetable Fragments found in the tombs and other monumental buildings of the Ancient Egyptians," he has not contributed anything to the published Transactions of the Society. This was probably due to the full occupation of his time by his official duties and his advancing

years. Here again, unfortunately, the Society did not reap that harvest of scientific work which it might reasonably have expected from the hands of so distinguished a scientist.

D. B. Adamson, elected a Fellow in 1867, was well known to all as being pre-eminently a mechanical genius, and many of the older Fellows will remember his exhibition of various mechanical novelties of his own workmanship. From 1878 he was a constant member of the Council of the Society, and by his punctual and unfailing attendance at the meetings he considerably assisted at the dispatch of the business of the Society. Even in the well-trodden paths of mechanics he succeeded in evoking certain new facts which were considered worthy of being recorded in the Transactions of the Society. His chief contributions were—"Improvements in Curré's Di-electric Machine" and "On Measuring the Power of Telescopic Eye-pieces." He also at different times exhibited photographs of the moon, and of the recent solar eclipse.

Six Fellows have resigned, namely, Hon. A. Campbell, H. P. Gill, S. Knevett, W. J. E. Middleton, C. Unbehaum, and G. Vickery.

Ten Fellows have had their names removed by the Council from the list of members for non-payment of arrears of subscriptions, namely, W. T. Angove, J. E. Brown, F. W. Davis, Thos. Gill, C. H. Harris, Prof. Lamb, E. Laughton, M. P. O'Leary, F. Wheeler, and C. L. Wragge.

The membership of the Society consists at the present time of 10 Hon. Fellows, 88 Fellows, 13 Corresponding Members, and 1 Associate.

The Council is able to report that, owing to the increased shelving accommodation, the books belonging to the Society are now arranged in an easily-accessible position. It would suggest, as a recommendation to the Council for the coming year, that it consider some plan for facilitating the access of the Fellows and Members to the books. As usual, many valuable monographs, and a continuance of the numerous scientific serial publications from all parts of the world, have been received.

In order to make the library of the Society still more comprehensive and complete, the Council has put itself in communication with a number of American and European scientific Societies, whose publications have been solicited in exchange for those of this Society. The names of the principal ones are as follows:—Department of Agriculture, Washington; American Assoc. Advancement of Science, Salem, Massachusetts; N. Y. Microscopical Society, New York; Society Natural Sciences, Buffalo, Indiana; The Entomological Club, Cambridge, Massachusetts; Society Natural History, Cincinatti; and the Zoological Society,

Philadelphia. The Italian Entomological Society, Florence; the National Museum Natural History, Genoa; the Italian Society Natural History, Milan; the Zoological Station, Naples; and the Natural Science Society, Pisa. The Anthropological Society, Vienna; also the Natural History Museum of the same place. The Royal Museum of Natural History, Brussels. The Asiatic Society of Japan. The Scientific Society, Mexico. The Imperial Society of Naturalists, Moscow; and the Geological Society of the Institute of Mines of St. Petersburg. Also the Minister of Public Instruction, Paris, has been written to; as well as the Entomological Society and Royal Academy, Brussels. From Liege, the Memoirs of the Royal Society of Sciences; and from Leyden, Notes from the Leyden Museum have been received. The list of Australian exchanges has also been further made up, making a total of over 40 new exchanges which your Council hopes in time the Society may receive.

Following its usual custom of acting as your steward, the Council has made grants of money to help in furthering certain local scientific works. The most noteworthy of these were those for collecting palæontological specimens at Curramulka, Y.P., and the MacDonnell Ranges.

The vacancy in the Council caused by the death of Mr. D. B. Adamson was filled by the election of Mr. W. B. Poole, a former member of the Council.

The Fellows will have noticed that Part I. of the current year's Transactions has already been published and issued; and that the artistic work displayed in the illustration of Dr. Stirling's description of *Notoryctes typhlops* is of a very high order, and reflects great credit on the lithographer (Mr. H. Barrett), the Society, and South Australia.

The statement of receipts and expenditure by the Hon. Treasurer (W. Rutt, C.E.) will show that the financial position of the Society continues sound, notwithstanding its heavy expenditure.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Dr.	£ s. d.	£ s. d.	Cr.	£ s. d.	£ s. d.
October 1st, 1890.			By Cost of Transactions—		
To Balance		332 16 8	Printing and Binding (1½ years)...	153 14 6	
" Subscriptions—			Illustrating, &c.	47 2 6	
Royal Society	108 3 0		Publishing	15 4 7	
Field Naturalists' Section ...	18 0 0				216 1 7
Microscopical Section	7 10 0		" Wages—Caretaker and Occasional Assistance		4 7 0
		133 13 0	" Printing, Postage, Telegrams, and Stationery		12 18 11
		145 1 0	" Advertising		8 14 2
" Government Grant		10 19 8	" Library—Binding		15 19 0
" Interest			" Stamp Duty		0 2 6
			" Grant in aid of Geological Exploration at Curramulka		3 0 0
			" Field Naturalists' Section—Grant		20 0 0
			" Microscopical Section—Grant ...		7 10 0
			September 30th, 1891.		
			By Balance—		
			Bank of South Australia	78 14 8	
			Savings Bank	255 2 6	
					333 17 2
		£622 10 4			£622 10 4

Audited and found correct.

D. J. ADCOCK, Auditor.

October 5th, 1891.

WALTER RUTT, Treasurer.

September 30th, 1891.

PRESIDENTIAL ADDRESS

To the Royal Society of South Australia, October 6, 1891.

It may be within the recollection of Fellows that when the Royal Society, a year ago, proposed to confer the office of President upon me, I *disclaimed* any *fitness* for it, on the ground that my little knowledge of science is confined to a single item in the great field of research, and that an item which is of special interest to very few of my colleagues; so that during my year of office the chair would be unable to take that part which befits its dignity in the various discussions of scientific matters that would probably come before the Society. I felt this strongly at that time, and I have felt it more strongly still as the time has come on when it is the duty of the President to address his colleagues at the annual meeting. Unfortunately, there is but one branch of science on which I could address you without a certainty of being ridiculous, and that branch of science belonging to Natural History is one that (I regret to know) is the subject of special study with very few of our Fellows.

Under these circumstances—although I have, of course, not thought of addressing you on any subject outside that which alone I have attempted to investigate—I have yet endeavoured to find some point from which to look at my own speciality that may also be a desirable point from which to regard at least *other branches of Natural History*. And, with this in mind, it has seemed to me that it would perhaps be no uninteresting task, nor yet an unprofitable one, to speculate upon the ultimate aim—the *final result* of the science which is called by that name Natural History—and to endeavour to place before our minds the particular contribution towards that result which the present generation of workers is more particularly qualified to render.

Such an inquiry is certainly not *wanting in practical importance*, because it is very clear that investigators who are aiming at a given result, soberly and reasonably regarded as possible for them, are infinitely more likely to render valuable service in the field of science than those who turn their attention here, there, and everywhere, and search, not for a recognised desideratum, but for any discovery that may chance to present itself to their gaze.

In the absolute *infancy* of scientific work such "free lances" are more likely to stumble upon what is valuable than when, at a

later time, scientific work has so far passed the stage of infancy that some idea can be formed concerning what it is likely to develop into.

Now, if a successful attempt is to be made to express in words the ultimate issue of studies in Natural History, it is clear, I think, that the mind must be prepared to look upon much that at present seems to be a *goal* as merely an initiatory stage. The *conclusions* towards which scientific workers are now struggling will, when they are reached, become mere premises to other conclusions, which perhaps again may have to become premises before Natural History can be strictly entitled to the name "science."

We in this generation are taking some of the earlier steps towards *making* it a science. I should suggest as an expression of what at present seems likely to be the *ultimate aim* of naturalists—the statement that their aim is to find out the reasons of the facts of nature. That is a subject that we know scarcely anything about. We can hardly be said to have discovered the meaning of even one or two of the signs on the hieroglyphic scroll of life which may serve as a beginning—by means of which we might attempt the task of deciphering the rest. For example, it certainly cannot be affirmed that the purpose of all the organs of the body in all animals is satisfactorily ascertained. Such a matter as that must be quite elementary in the enquiry I have spoken of, and ignorance or doubt concerning it must absolutely bar the path to the elucidation of more complex problems.

The imagination can delight itself in a world of infinitely interesting speculation if it enter upon the consideration of what will be some of those more complex problems that our descendants will, sooner or later, no doubt be in a position to approach. Take, for example, the question, "What are the reasons of the geographical distribution of species?" When one ponders the marvels of that distribution—how some one characteristic, perhaps a slight (and what seems to us to-day a *curious, unaccountable*) one, appears, and is persistent, or at least frequent, through a long series of species in a particular locality—as, for example, the tendency (in the Australian *Coleoptera)* to the disappearance of one or both claws of the tarsi; or, again, when one notices how certain types (of which *Stigmodera* is an example in Australia—where there are nearly 300 known species) seem to run riot, both in respect of fecundity and development, while others (apparently no less truly indigenous to the country) remain much less plentiful, and much less prolific in development (of which many examples might be cited—for the sake of an instance I will mention the remarkable *Phytophagous* beetle which Professor Westwood some 40 years ago named *Diphyllocera*, and of which there has only since been found one near ally on the Continent);

or yet again, if one observe the strange effect of *climate* on *color*, how, in one genus (say *Stigmodera)* by far the most richly-colored (as well as largest) species are found in the cooler latitudes, while the genus seems to decline in every way, becoming rarer, and represented by smaller, less brilliant forms as one approaches the tropics, while in another group (say the *Lamiides)* the case is absolutely reversed; when one takes all these and many other such remarkable facts into account, it is impossible to doubt that there is a *reason* for their being facts written, it may be in *geological*, it may be in *chemical* characters, and its record stored deeply in the bowels of the earth, or floating in the atmosphere, or on the ocean, awaiting the day when science shall be strong enough and wise enough to seize and read that record.

I think it is not passing the limits of what we are justified in asserting, to say that for every variety of structure in every species there is a *reason* (at least *conceivably* discoverable). Such an assertion is not based upon any particular view of the *nature* of species. On the theory of their immutability it may be assumed that the Creator of the various forms of life endowed each form with characters suited to what its needs would be, and therefore resulting (even though only by *anticipation)* from its environment. On any theory of *development* or *natural selection*, each character would, of course, *necessarily* be the *direct resultant* of some feature or features in the environment by means of which its development had been provided for.

If this be accepted as an *axiom*, and it really appears to me that it ought to be so accepted, there opens out a field of operations bewildering in its vastness in which one branch of natural science may be foreseen to throw light upon another, in which the problems and perplexities and difficulties of one class of workers may be solved by another class who are investigating what seems to be a totally disconnected subject, and in which some wide-reaching truth may be brought to light by the observance of some character or phenomenon in some sphere of study that for one reason or other appears among the least likely to be productive of important conclusions.

Thus, it is probable that if the reasons were adequately known of *the prevalence of given generic characters in given localities*, they would throw a flood of light upon *geology ;* and *vice versa* if the geological history (in the widest sense of that expression) of a particular country were known in all its details with absolute accuracy, we should be able to specify without much difficulty the reason why the development of the fauna of that country tended in a given direction.

Indeed, it has always appeared to me one of the strongest of arguments for the truth of the theory of development (which

might almost as well be called the theory of adaptation) that that theory fits in so well with the geological and climatic changes that we know to have occurred in all parts of the world. An unchangeable fauna in the midst of perpetually changing environment would not seem *likely* on *a priori* grounds to have been the form in which the Creator of the universe would design His work. It would be safe to affirm, I believe, that there is no species on the globe which, on the theory of its having been created in its present form, and incapable of structural modification, could have survived the changes that have taken place on and around the earth's surface.

Here, then, we have what (if not the *ultimate* work of natural science) will at any rate be its work in a very advanced period of its career, the investigation of the *reasons* of the facts of nature.

Interesting—even fascinating—as is the contemplation of the problems we can imagine our successors in the field of science a century hence being in a position to investigate successfully, I have, nevertheless, not brought the matter before you this evening merely as a curious speculation, but rather with the purpose of asking your attention to the importance of that step towards the eventual achievement, which falls to the lot of the scientific workers of the present day.

I think it will hardly be doubted that the special task needing to be accomplished by this generation, and in the present state of knowledge, is that of collecting and recording *facts and data*. I imagine there is scarcely a *possibility* of any more advanced work being more than *guessed* at in the lifetime of any one now working at science. The moment one attempts the more complex problems, one feels instantly the need of that exhaustive collection of the data and records of the facts that we are at present engaged in procuring.

Suppose, for example, the question be propounded, "Why is such and such a genus (say *Stigmodera*) an especially Southern Australian form?" We can *imagine* the reason to be founded on some long past *geological* change; but an apparently essential condition of any certainty on the point would be a very accurate and exhaustive knowledge of the fossils of all Australia —so that either it could be determined whether the present distribution is a continuance of that of former periods, or at least it might be said "there is sound reason to believe that geology can *throw no light* on the distribution of that genus in former ages." Geologists are at present working towards the ability to supply such information.

And again, if any attempt be made to generalise from the facts of geographical distribution, as I have no doubt some of my colleagues have learned by experience, the result is little more

satisfactory than a quickening of one's realization of how little is known concerning it. There are whole *orders* of animals whose geographical range in Australia has scarcely even *begun* to be worked out. Even in the *Coleoptera*—one of the orders that has received most attention—there are comparatively speaking very few genera of which it would be safe to affirm that it had been definitely *proved by facts* to be principally connected with a southern or a northern latitude in Australia, and so forth.

There are vast tracts of the continent of whose fauna we know very little. And even of those parts which have been *more* carefully investigated, the investigation has been productive of little more than a skimming of the surface (at least, as far as regards *publication*). I am not making mere guesses when I say this, for it can be supported with facts. Let me state a few facts. In respect of the vast order *Hemiptera*, including all its near allies—*Homoptera*, &c.—there is not, and, as far as I can ascertain, there *has not been* a single Australian worker—at any rate, not one who has published any scientific work on the subject. The same thing may be said, I believe, of the *Orthoptera* and *Neuroptera*. *One* Australian is working at the *Diptera ; one* at the *Hymenoptera*.

I am not overlooking the fact that here and there an isolated note may have been published on some member of one or other of these groups ; I believe, indeed, that the late Mr. W. S. Macleay, of Sydney (standing almost alone as an Australian scientific entomologist of the last generation) did publish descriptions of a few members of the orders I have named—or some of them ; and possibly one or two others may have just touched the subject. But there is no one who is working at them, and publishing on them in Australia in any systematic fashion. And how little has been accomplished even in those orders which have received more attention than others is realised almost distressingly by those who are working at them, in the enormous proportion of undescribed species that accumulate in any collection—accumulate with rapidity and to an extent that almost leads one to become confused and despairing amid the unwieldy mass of material.

Here, again, let me cite specific proofs of what I say. In the family *Hydrophilidæ* (a family containing some of the largest species in the whole order *Coleoptera*), my own small collection contains more species than the total that had been described from all Australia up to the date when the last edition of the "Catalogue of Australian Coleoptera" was published (some six years ago). Among the *smaller Coleoptera* the case is still more remarkable ; in the family *Cissidæ* (which is numerously represented in Australia) four years ago no Australian species whatever had been described ; in the *Dermestidæ* 13 species had been

described up to last year from all Australia; my collection contains 22 species. In the *Lathridiidæ*, the number described up to a couple of years ago was four from all Australia; my collection contains 18; probably some of the larger collections (the Sydney or Macleay Museum, for example) contain 50 or more. Thus you see that even in one of the most admired orders of insects the mere work of describing the Australian species is still in its infancy.

It appears, therefore, that the contribution towards natural seience, which it falls to the lot of this generation to make, is an accurate statement of facts, which may serve as reliable data in the future.

And here I will point out that not only are we of the present day little, if at all, qualified to attempt higher work, but also that any hope of the accomplishment even eventually of higher work must depend very much on what is done in this generation to provide the required data for our successors. Every day that passes renders those data more difficult to obtain, and less reliable. And that because the work of the world in many of its operations is disturbing the order of Nature. Commerce, for example, is rendering many other races of animals besides those of man and many plants cosmopolitan.

Here, too, I call your attention to the fact that Australia is probably of all the continents that in which the most important and reliable observations can be made. It has often been referred to as a remarkable phenomenon that whereas in the Old World—where the country is cut up into well-protected enclosures, by mighty ranges of snow-clad mountains, and by rivers that man himself is almost at a loss to bridge—the vast majority of species are of very wide distribution, many extending their habitat even from the islands off the West of Europe to those off the East of Asia; here on this Australian continent of vast and waterless plains, where for hundreds of miles the traveller will meet with nothing that could be called the boundary of a natural district, where, if an observant man could be set down in succession at any intervals along a line of two thousand miles, from near the east coast in N. S. Wales, to near the west coast in the neighborhood of Perth, he could scarcely decide from the superficial features of the country whether he was not all the time within a mile or two of his starting point—where wide distribution of species would seem much more probable than in almost any other region of the world—the precisé reverse is the case, and there seems to be no other continent where so *few* species have a wide distribution.

This exceptionally limited distribution of species, where the reverse might reasonably have been expected, has often been

referred to as very surprising. But, I would ask, is it not very probable that the reason why this distribution is so limited is simply that it is *natural*, or nearly so? In most other extensive regions on the earth's surface it has been the case for thousands of years that commerce has been transporting the productions of each place to far distant points, and it can scarcely be thought likely that many species—at least of plants and the lower animals—could fail to have been at some time in such period transported by accident along with articles of trade, and under circumstances suitable to the establishment of their race. It was not until this process had continued for thousands of years that science entered upon the work of systematically describing and naming the various forms of life.

But in Australia the confusing hand of commerce has been held back from tampering with Nature's order until a time when science was to some extent prepared to enter the field, and (as you will, no doubt, remember) the scientific results of Australian exploration from the time of Capt. Cook onwards have been chronicled in at least a sketchy manner.

The reliance that can be placed on the naturalness of the occurrence of any species in an Australian locality is, however, every day becoming less. If there is to be an exhaustive and accurate record handed down for future use in science of the indigenous distribution of species on any large area of the earth's surface—which looks likely enough to be an essential condition of success in solving the more complex problems of natural science that will come before our successors—it would scarcely be going too far to say that it must be made in Australia; and it is absolutely certain that if it is to be made at all it must be made at once. Not only are plants and animals from other continents being naturalised, but those of one locality in Australia are being planted (and are propagating) in other and distant places. As an example, I may mention that only quite recently I have learned, through the observations of the Victorian Colonial Entomologist, that there has of late begun to be met with in Victoria a *Buprestid*, which I find to be *Stigmodera Brucki*, Thoms., an extremely handsome species indigenous to Western Australia, and which there can hardly be a doubt has been introduced into Victoria in timber from Western Australia.

Every year such occurrences become more and more probable, and they will to an increasing extent disturb the natural distribution of species. It is easy to perceive how in future times, and when natural science is in a very advanced state, the absence of reliable information as to what part of Australia is the real home of numerous species which will then probably be distributed over the whole continent, may most seriously interfere with the solution of many most important problems.

Much, then, in the possibilities of the future in respect of natural science depends upon the thoroughness and accuracy of the work that is done by the scientific men of the present day. If it is not done by them, the opportunity so far as regards a considerable part of it will have been lost for ever. What we have to aim at is (*a*) to catalogue, with sufficient description of an accurate well-worked-out character, all the species found in Australia; and (*b*) to place on record, with exact precision—the result of personal observation, not mere hearsay—a statement of the locality which each species inhabits, and of its manner of life.

But here I shall ask you to notice that the energetic pursuit of this work has a most important bearing upon *economic* science. It is frequently the case (to take an example illustrative of this remark) that some animal (say an insect) exists side by side with some hostile influence—it may be another animal—which latter appears to be the sole instrument that prevents its multiplying to an extent that would render it most mischievous. An instance of this is afforded by many of the wood-boring *Coleoptera*, which are preyed upon by *Coleoptera* of the carnivorous groups. Now, if the potentially injurious species be by any means introduced into some locality at a distance from its native habitat without its enemy also being introduced, it is very likely that—nature in its new abode being not armed against it—it will become a scourge, and entail the loss of most valuable property. When this occurs there is an outcry at once raised for a *remedy*, and persons not skilled in Natural History usually look towards the idea of using some chemical substance to poison the depredator or to render that on which it preys distasteful to it. But the direction in which the intelligent scientist will look for a remedy will be very different. His first question will be, "Where is the real home of this species?" and he will feel little doubt that the remedy is to be found in something there which has enabled the article needing protection elsewhere to go on existing in that particular locality in spite of the ravages of its destroyer.

It would not be too much to say that there are hundreds of the most local species of insects which are capable, if transported to localities at a distance from their natural home, of becoming *most injurious to vegetation*; and that in almost every such instance the checking of their mischief could be accomplished only by the transportation in addition of something which in their home has been hostile to their development. The next ten or twenty years will probably see an enormous multiplication of insect pests, owing to the increasing facilities for species being accidentally carried out of their natural and controlling environment.

Thus you observe that what at first sight looks like *barren* scientific investigation—I refer to the work of simply cataloguing and describing species, and recording their habitat, without any direct reference to economic questions—is in reality of the utmost importance. If an insect pest appear (devastating the timber or the foliage of a district), and no one knows whence it comes, the clue to the method of checking its ravages is missing, and the state of affairs is certainly serious. But if the scientist be at once prepared to say, "This is such and such a species, which is indigenous in such and such a locality, where it is not known to be particularly harmful," it at once becomes tolerably *certain* that a little intelligent investigation in the place indicated will suggest the remedy.

Nor can I omit to remark here that the Governments of the Australian colonies would act wisely if they were to accord more substantial aid than they do to the study of Natural History simply as abstract science, for no one can tell the practical value that may eventually attach itself to the record of even the slightest observation. In two of the sister colonies a "colonial entomologist" has been appointed, whose special work is to investigate the means of checking the ravages of insect pests; and that is, of course, a desirable precaution to have taken. But I venture to say that a few persons possessing a fair knowledge of natural science scattered over each colony, and especially in newly-occupied country, and working there at Natural History as such—and without any direct reference to economic questions—I venture to say that a few such workers would be of almost incalculable value in rendering the work of a "colonial entomologist" capable of attaining its purpose. Civilization and agriculture are advancing year by year, and taking possession for man's use of new tracts of country containing—beyond the possibilities that make for wealth and maintenance—multitudes of natural phenomena and forms of life which are so nicely balanced in numbers and power that no one of them is able to become seriously injurious to the others, but many of which might become so elsewhere if man should have the misfortune by any accident to convey them to distant localities. Surely, then, it is of the utmost importance that simultaneously with the advent of commerce and traffic, science should be represented, and should make its census of the local forms and conditions of life; so that if at some future time some form of life, harmless in its natural abode, should make its appearance elsewhere, having there become a scourge to agriculture, or other forms of industry, it may be at once recognised and traced to its home, where its antidote is no doubt to be found.

It is perhaps difficult to make practicable suggestions as to the method in which a Government could actively aid in scientific

investigation of the general kind which in the issue will prove to be of even greater importance and more "economic" than what is commonly called "economic science." But I may perhaps draw your attention once more to the fact (mentioned in our annual report) of this Society having recently spent from its funds in paying the travelling expenses of an agent, whom it sent to report upon certain local matters of scientific interest at a distance from Adelaide, and I draw your attention to it in order to suggest the question whether the Government might not fairly be asked to facilitate such investigations by permitting the free use of its railways for a specified journey by a specified person, say, under the condition of a certificate from the Council of the Royal Society, that it was sought for the *bona fide* purpose of desirable scientific exploration, which the person in question was competent to make. It certainly seems a short-sighted policy for a scientific Society to be obliged to pay travelling expenses on Government railways out of its scanty funds in order to procure information that on public grounds it is most desirable should be obtained. There can be no doubt that a very great deal of our scientific work is rendered incomplete, and that facts we desire to discover and observations which ought to be made are lost, perhaps irrecoverably, because of the difficulty of procuring reliable information as to the fauna of the remotest parts of the colony, in which difficulty the cost of travelling is one of the most formidable items; and it is not within the means of this Society to provide funds for the purpose on any sufficiently large scale.

I trust you will pardon me for having detained you so long listening to an address on a subject that is more or less outside the special lines of work that most of the Fellows of our Society are pursuing; and I trust, too, that what I have said may prove to have the effect of suggesting to the minds of some of our Fellows who are not actively pursuing any scientific work, that it really is important for natural science to be investigated and pushed on with as speedily as possible; a suggestion which might well induce them to take up the study of some scientific matter that has been as yet neglected on this continent, and so assist the ultimate purpose of our Society even more satisfactorily than they can do by their merely passive interest and pecuniary support.

DONATIONS TO THE LIBRARY

For the Year 1890-91.

TRANSACTIONS, JOURNALS, AND REPORTS.

Presented by the respective Societies, Editors, and Governments.

Argentine States.

Buenos Ayres—Revista Argentina de Historia Naturel, tome I., entrega 1 to 3.

Austria and Germany.

Berlin—Verhandlungen der Gesellschaft für Erdkunde, band XVII., Nos. 8, 9, 10; band XVIII., Nos. 1 to 6.
——— Zeitschrift, ditto, band XXV., Nos. 4 to 6; band XXVI., Nos. 1 to 3.
——— Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften zu Berlin, Nos. 20 to 53 (1890).
——— Abhandlungen der Königlich Preussischen Meteorologischen Instituts, band I., Nos. 1 to 3.
——— Ditto, ditto, Observatorium bei Potsdam.
——— Ergebnisse der Meteorologischen Beobachtungen, heft I., II.
Gottingen—Nachrichten von der K. Gesellschaft der Wissenschaften u. der Georg-August Universität, Nos. 1 to 21, 1889.
Halle—Leopoldina, heft 25, 1879.
——— Nova Acta der K. Leop. Carol. Deutchen Akad. der Naturforscher, band L., Nos. 3 and 6; band LII., Nos. 2 and 5; band LIV., No. 1.
Munich—Sitzungsberichte der Mathematisch-Physikalischen Classe der K. B. Akad. der Wissenschaften zu Munich, heft III., 1888; heft I., II., 1889.
——— Festrede, ditto, 1888, 1889.
——— Abhandlungen, ditto, band XVII., part 1.
Vienna—Sitzungsberichte der Mathematisch-Naturwissenschaftlichen Classe K. Akad. der Wissenschaften, Nos. 13 to 17.
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LIST OF FELLOWS, MEMBERS, &c.

NOVEMBER, 1891.

Those marked (F) were present at the first meeting when the Society was founded. Those marked (L) are Life Fellows. Those marked with an asterisk have contributed papers published in the Society's Transactions.

Any changes in the addresses should be notified to the Secretary.

Date of Election.

HONORARY FELLOWS.

1857. BARKELY, SIR HENRY, K.C.M.G., K.C.B., F.R.S., Royal Colonial Institute, London.
1876. ELLERY, R. L. J., F.R.S., F.R.A.S., Government Astronomer, Victoria, The Observatory, Melbourne, Victoria.
1890. *ETHERIDGE, ROBERT, Palæontologist to the Geological Survey of New South Wales, Sydney.
1853. GARRAN, A., LL.D., Sydney, New South Wales.
1855. HULL, H. M., Hobart, Tasmania.
1878. JERVOIS, SIR W. F. D., K.C.M.G., C.B., F.R.S., Ex-Governor of South Australia, London, England.
1855. LITTLE, E.
1878. MACLEAY, SIR WILLIAM JOHN, F.L.S., Ex-President Linn. Soc. N.S.W., Sydney, New South Wales.
1879. *MUELLER, BARON F. VON, K.C.M.G., F.R.S., M. and Ph.D., F.G.S., F.R.G.S., F.C.S., C.M.Z.S., &c., &c., Government Botanist, Melbourne, Victoria.
1876. RUSSELL, H. C., B.A., F.R.S., F.R.A.S., Government Astronomer N.S.W., Sydney, New South Wales.

CORRESPONDING MEMBERS.

1881. BAILEY, F.M., F.L.S., Colonial Botanist, Brisbane, Queensland.
1880. CANHAM, J., Stuart's Creek, Beltana, South Australia.
1881. *CLOUD, T. C., F.C.S., Manager Wallaroo Smelting Works, South Australia.
1888. *DENNANT, JOHN, F.G.S., F.C.S., Inspector of Schools, Glenferrie, Melbourne, Victoria.
1880. *FOELSCHE, PAUL, Inspector of Police, Palmerston, Northern Territory, Australia.
1881. GOLDSTEIN, J. R. Y., Melbourne, Victoria.
1878. *HAYTER, H. H., M.A., C.M.G., F.S.S., Government Statist, Melbourne, Victoria.
1880. *KEMPE, REV. J., Hermannsburg, Charlotte Waters, South Australia.

1889. *MacGillivray, P. H., M.R.C.S., F.L.S., Bendigo, Victoria.
1888. *Maskell, W. M., Wellington, New Zealand.
1886. Nicolay, Rev. C. G., Fremantle, Western Australia.
1880. *Richards, Mrs. A., Beltana, South Australia.
1883. *Stirling, James, F.L.S., Assistant Geological Surveyor, Elsternwick, Victoria.

FELLOWS.

1887. Adcock, D. J., Adelaide, S A.
1874. Angas, Hon. J. H., M.L.C., Adelaide, S.A.
1891. Ashby, Edwin, North Adelaide, S.A.
1887. Bagot, John, Adelaide, S.A.
1887. *Blackburn, Rev. Thomas, B.A., Woodville, South Australia.
1890. Board, Gregory, Metallurgist Port Pirie Smelting Works, Port Pirie, S.A.
1884. Boettger, Otto, Adelaide, S.A.
1886. Bragg, W. H., M.A., Professor of Mathematics University of Adelaide, S.A.
1882. Brown, L. G., Adelaide, S.A.
1883. *Brown, H. Y. L., F.G.S., Government Geologist South Australia, Adelaide.
1884. Bussell, J. W., F.R.M.S., North Adelaide, S.A.
1891. Calvert, A. F., Adelaide, S.A.
1888. Chapman, R. W., M.A., B.C.E., Lecturer on Mathematies and Physics University of Adelaide, S.A.
1879. *Cleland, W. L., M.B., Ch.M., F.R.M.S., J.P., Assistant Colonial Surgeon, Resident Medical Officer Parkside Lunatic Asylum, Lecturer on Materia Medica University of Adelaide, Parkside, S.A.
1876. (L) Cooke, E., Commissioner of Audit South Australia, Adelaide.
1880. Cox, W. C., Semaphore, S.A.
1887. *Dixon, Samuel, Adelaide, S.A.
1876. Dobbie, A. W., Adelaide, S.A.
1890. *East, J. J., F.G.S., Registrar School of Mines, Adelaide, S.A. (Corresponding Member, 1884).
1871. Elder, Sir Thomas, K.C.M.G., Adelaide, S.A.
1887. Eyres, Thomas, Adelaide, S.A.
1886. Fleming, David, Adelaide, S.A.
1890. Fletcher, Alfred W., B.Sc., Kent Town, S.A.
1876. Fletcher, Rev. W. Roby, M.A., Kent Town, S.A.
1883. Foote, Henry, Burnside, S.A.
1882. Fowler, William, Kulpara, S.A.
1889. Fraser, J. C., Adelaide, S.A.
1882. Gardner, William, M.D., Ch.M., Lecturer on the Principles and Practice of Surgery and on Clinical Surgery University of Adelaide, Hon. Surgeon to the Adelaide Hospital, S.A.
1891. Gill, Walter, F.L.S., Conservator of Forests South Australia, Adelaide
1880. *Goyder, George, Jun., Government Analyst South Australia, Adelaide.
1890. Gray, Rev. William, Tanna, New Hebrides.
1887. Grasby, W. C., Editor *Garden and Field*, Adelaide, S.A.
1876. Harrold, A. L., Adelaide, S.A.
1861. Hay, Alexander, Adelaide, S.A.
1882. Henry, Alexander, M.D., Adelaide, S.A.
1891. Holtze, Maurice, F.L.S., Director Botanic Gardens, Adelaide (Corresponding Member, 1882), Adelaide, S.A.
1883. *Howchin, Walter, F.G.S., Goodwood, S.A.

1883. Hughes, H. White, Booyoolie, S.A.
1891. Johnson, J., M.D., F.R.C.S., Medical Officer Mount Gambier Hospital, Assistant Colonial Surgeon, Mount Gambier, S.A.
1853. (F) Kay, Robert, General Director and Secretary S.A. Public Library, Museum, &c., Adelaide, S.A.
1884. Lendon, A. A., M.D., M.R.C.S., Lecturer on Forensic Medicine and on Clinical Medicine University of Adelaide, Hon. Physician Adelaide Hospital and Children's Hospital, North Adelaide, Adelaide, S.A.
1856. Lloyd, J. S., Adelaide, S.A.
1889. Loughhead, Jas. H., Adelaide, S.A.
1888. Lower, O. B., Parkside, Unley, S.A.
1885. *Lucas, R. B., Adelaide, S.A.
1873. Magarey, A. T., Adelaide, S.A.
1874. *Magarey, Hon. S. J., M.D., M.L.C., Adelaide, S.A.
1853. Mayo, George, F.R.C.S., Adelaide, S.A.
1874. Mayo, G. G., C.E., Adelaide, S.A.
1882. *Meyrick, E. T., B.A., Ramsbury, Hungerford, Wilts, England.
1880. Molineux, A., Secretary Central Agricultural Bureau South Australia, Kent Town, S.A.
1859. (L) Murray, David, Adelaide, S.A.
1884. Munton, H. S., Brighton, S.A.
1883. Phillips, W. H., Adelaide, S.A.
1886. Poole, W. B., Adelaide, S.A.
1882. Robertson, R., F.F.P.S., Adelaide, S.A.
1885. *Rennie, H. E., M.A., D.Sc., F.C.S., Professor of Chemistry University of Adelaide.
1885. Renner, F. E., M.D., Petersburg, S.A.
1891. Rogers, R. S., M.D., Adelaide, S.A.
1879. Russell, William, Port Adelaide, S.A.
1876. *Rutt, Walter, C.E., Adelaide, S.A.
1866. Salom, M., Adelaide, S.A.
1891. Saunders, Ernest C., Glenelg. S.A.
1891. Selway, W. H., Jun., Adelaide, S.A.
1886. Scott, James L., Hyde Park, S.A.
1857. Smeaton, Thomas D., Blakiston, Little Hampton, S.A.
1871. Smith, Robert Barr, Adelaide, S.A.
1882. Smythe, J. T., B.A., B.E., Inspector of Schools South Australia, Glenelg, S.A.
1881. *Stirling, Edward C., M.A., M.D., F.R.C.S., Lecturer on Physiology University of Adelaide, Hon. Director S.A. Museum, Hon. Surgeon Adelaide Hospital, Adelaide, S.A.
1878. Stuckey, J. J., M.A., Adelaide, S.A.
1876. *Tate, Ralph, F.L.S., F.G.S., Professor of Natural Science University of Adelaide.
1877. *Thomas, J. D., M.D., F.R.C.S., Adelaide, S.A.
1886. *Tepper, J. G. O., F.L.S., Entomologist S.A. Museum (Corresponding Member, 1878), Adelaide, S.A.
1856. *Todd, Charles, C.M.G., M.A., F.R.S., F.R.A.S. Government Astronomer, Postmaster-General, and Superintendent of Telegraphs South Australia, Adelaide, S.A.
1882. Tyas, J. W., Registrar University of Adelaide, S.A.
1889. Vardon, Joseph, J.P., Adelaide, S.A.
1878. *Verco, Joseph C., M.D., F.R.C.S., Lecturer on the Principles and Practice of Medicine and Therapeutics and on Clinical Medicine University of Adelaide, Hon. Physician Adelaide Hospital, Adelaide, S.A.
1883. Wainwright, E. H., B.Sc., St. Peter's College, S.A.

1878. Ware, W. L., Adelaide, S.A.
1879. Way, Edward W., M.B., M.R.C.S., Lecturer on Obstetrics and Diseases Peculiar to Women and Children University of Adelaide, Hon. Physician Adelaide Hospital, Adelaide, S.A.
1859. Way, Samuel J., Chief Justice and Lieutenant-Governor South Australia, Adelaide, S.A.
1882. *Whittell, Horatio, M.D., M.R.C.S., F.R.M.S., President Central Board of Health and City Coroner Adelaide, Adelaide, S.A.
1886. Wilson, John, F.E.T.S., Goodwood, S.A.
1886. *Zietz, A., Assistant Director S.A. Museum, Adelaide, S.A.

ASSOCIATE.

1884. Hodgson, Mrs., North Adelaide, S.A.

APPENDICES.

FIELD NATURALISTS' SECTION

OF THE

Royal Society of South Australia.

ANNUAL REPORT.

The Committee have pleasure in submitting their eighth Annual Report, being for the year ending 30th September, 1891.

Evening Meetings.—Nine evening meetings have been held during the year, at which ten papers have been read. The average attendance again shows an improvement on that of the previous year. The largest number present at an ordinary meeting was 40, whilst at the annual conversazione in October last, about 120 persons attended. With each year of the Section's growth the difficulty increases of obtaining papers without falling back on the same contributors, owing to the limited number of those able or willing to assist in this direction. We have been fortunate, however, in the year under review in obtaining papers on a great variety of subjects, some of which have been contributed by gentleman not members of the Section, whose lectures have proved unusually interesting and instructive, and whose help has been greatly appreciated. The following gentlemen have given either lectures or papers during the year, viz., Professor E. H. Rennie, D.Sc., Rev. T. Blackburn, B.A., Messrs. W. C. Grasby, D. B. Adamson, J. G. O. Tepper, F.L.S., S. Dixon, F. C. Earp, Ph.D., F.C.S., and J. G. McDougall (corresponding member). Your Committee were pleased to receive a paper from a corresponding member, and hope that others will in this way give the Section the benefit of their local observations, as much valuable information may be gained by this means. The subjects of the papers read during the year may be classified as follows:—Astronomy, 1 ; chemistry, 2 ; geology and mineralogy 1 ; botany, 1 ; zoology, 1 ; and general subjects (tourists' observations, &c.), 4. The exhibits have, as usual, formed an interesting feature at these meetings. For many of the specimens the Section is indebted to our corresponding members, from whom it is hoped that a still larger number of contributions will be re-

ceived during the coming year. The conversazione was generally regarded as the most successful gathering of this kind yet held in connection with the Section. The attendance was very large; the exhibits were of unusual excellence; and the whole arrangements gave the greatest satisfaction.

Excursions.—There have been six excursions during the year, at which the attendance has been fairly maintained. Whilst enjoyable as a means of recreation, these outings afford an opportunity of gaining much valuable information of a practical kind, and your Committee trust that these facilities will be more largely utilised by the members. Notwithstanding the difficulty that now exists of finding fresh localities suitable for these outdoor gatherings, almost all the places to which excursions have been held this year have been visited for the first time by the Section. The most successful excursion, from a botanical point of view, was that to Teatree Gully on September 1st, when a rich sandy scrub was met with, containing many plants not usually seen near Adelaide.

Protection of our Native Fauna and Flora.—A separate report from the Committee appointed for this purpose will explain what progress has been made during the past year in connection with this important department of the Section's work.

Publications.—During the year an exchange of publications has been arranged with the Australian Museum, Sydney, from which institution some valuable "Records," &c., have been received. The "Victorian Naturalist" (the journal of the Field Naturalists' Club of Victoria) continues to be regularly supplied to the Section.

Membership.—During the year 13 persons were elected as members of the Section, and 18 names have been removed on account of resignation and other causes. The number now on the roll is 103.

Saml. Dixon, Chairman.
W. H. Selway, Jun., Hon. Sec.

Adelaide, 21st September 1891.

Third Annual Progress Report of the Native Fauna and Flora Protection Committee.

In presenting their Third Annual Progress Report, the Committee, although regretting that the advance made has been somewhat tardy, are yet glad to be able to point to certain facts which should give satisfaction.

National Parks.—Owing to the difficulty experienced in getting the Government to take action, the Town Clerk of Adelaide (Mr.

T. Worsnop), at the instance of the City Corporation, acting in concert with the Committee, prepared a Bill last year vesting the whole of Government Farm in trustees in perpetuity as a National Park. The measure was entrusted to the charge of the Hon. S. Tomkinson, but was not introduced owing to a technical objection raised by the President. The Committee have, however, at last succeeded in gaining from the Premier (Hon. T. Playford) a promise that a Bill with similar objects will be introduced by the Government during the present session. The board of trustees suggested by the Committee includes one representative each of the Royal Society, the University, and the Municipal Association, the Mayor of Adelaide, the Chairman of the Botanic Board, and the Conservator of Forests *ex-officio*, and a Government nominee —a total of seven members.

Forest Reserves.—Last session, on the motion of the Hon. F. Krichauff, the Upper House decided that all forfeited lands in the Hundred of Para Wirra east of the main road from Mount Crawford to Gumeracha should be declared a forest reserve. In answer to an enquiry made by the Committee this year, the Commissioner of Crown Lands (Hon. W. Copley) has stated that these lands are reserved for the protection of the indigenous fauna and flora. Last year the Council also instructed the Surveyor-General to prepare a report as to other suitable sites for forest reserves.

Game Laws.—At the next meeting of the Australasian Association for the Advancement of Science, an attempt will be made to secure concerted action in the different provinces with respect to the amendment of the Game Laws. As in previous years, placards notifying the provisions of the Game Act have been distributed throughout the province by direction of the Commissioner of Crown Lands. The Committee desire to thank Mr. Copley for the special attention which he has given to this matter, and to express their pleasure at noticing certain prosecutions under the Act. On the motion of Mr. Hancock, the Lower House has affirmed the desirableness of declaring a close season for the kangaroo, and the Government have promised to introduce a Bill dealing with the question. The Committee believe that there is a probability of the subject being discussed more reasonably now than it was two years ago.

In conclusion, the Committee can only again express the hope that all friends of the movement will aid them in gaining the desired end.

Saml. Dixon, Chairman.
A. F. Robin, Hon. Sec.

Adelaide, September 21, 1891.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Receipts and Expenditure for the Year 1890-91.

Dr. Receipts.	£	s.	d.	Cr. Expenditure.	£	s.	d.
To Balance brought forward	5	1	10	By Printing (General)	3	19	0
" Grant from Royal Society	20	0	0	" Printing (Proceedings)	4	15	0
" Subscriptions	18	0	0	" Postages	5	13	0
				" Advertising	3	3	11
				" Attendance	1	4	0
				" Sundries	2	2	10
					20	17	9
				" Subscriptions, as per contra, handed over to Hon. Sec. Royal Society	18	0	0
				" Balance in Hand	4	4	1
	£43	1	10		£43	1	10

Audited and found correct,

J. H. C. LANGDON,
THOS. EVANS, } Auditors.

W. H. SELWAY, Jun., Hon. Sec.

Adelaide, 21st September, 1891.

MICROSCOPICAL SECTION

OF THE

Royal Society of South Australia.

ANNUAL REPORT, 1890-91.

The Committee, in submitting the Sixth Annual Report, are glad to be able to state that though the number of members is less than at any previous period, there is no lack of interest on the part of those who are really workers with the microscope, and the Section may now be considered as having stood the test of time, and is likely to be still the rallying point for all those engaged in this branch of scientific investigation.

The attendance during part of the session was not as good as it should have been from several causes, but with the return of our Chairman from England greater interest was manifested, and the number of members present at the meetings was considerably increased.

We regret to have to report the death of one of our Vice-Chairmen, Mr. F. S. Crawford, which was a great loss, not only to the Section, but to the colony as a whole. We are pleased that one whose scientific acquirements in his own special department were known beyond the limits of South Australia, was identified so closely with the Section from its formation.

Our Chairman, Mr. Poole, during his visit to Europe, took great pains in acquiring all the information he possibly could on microscopical matters, and we are glad to find that he was everywhere received with great kindness by fellow-workers with the microscope, and we trust that the experience gained by him will be of great service to us.

During the year the following donations of books have been made to the Section :—

A Synonymic Catalogue of the recent Marine Bryozoa, by Miss Jelly ; presented by Dr. H. T. Whittell.
3 vols. American Journal of Microscopy, bound, for 1877-9.
1 vol. ditto ditto, unbound, for 1881.

The total number of bound volumes in the library is 98, making a valuable collection of works of reference.

We have purchased during the year a good 1½-in. objective for use with the microscope belonging to the Section, and hope shortly to be able to add some higher powers.

We regret that no excursions have been made during the past session, the dryness of the season giving little promise of much success in the way of obtaining pond-life. We hope, however, that we shall be able to commmence again these pleasant and helpful means of increasing our knowledge of the objects of the unseen world around us.

The present number of members is 25 ordinary and 4 honorary. One member only has been elected during the year.

The business and subjects discussed at the meetings were as follows :—

1890.

Oct. 13. "The Foraminifera of the Port River," by Mr. W Howchin, F.R.G.S.

Nov. 11. Exhibition of Lantern Slides of Microscopical Objects, with Optical Lantern, by the Secretary (J. W. Bussell).

1891.

Mar. 10. Gossip Meeting.

April14. Exhibition of various Objects of Interest.

May 12. Address by Chairman (Mr. W. B. Poole) on "Microscopical Matters of Interest."

June 9. Exhibition of Lantern Slides of Photo-micrographs, by Optical Lantern, by the Secretary (J. W. Bussell).

July 12. Demonstration on the Best Method of Illuminating by Central Light, by Chairman (Mr. W. B. Poole).

Aug. 11. Continuation of above.

The balance-sheet shows a balance in hand of £3 12s. 5d., after paying all accounts.

MICROSCOPICAL SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

RECEIPTS AND EXPENDITURE FOR YEAR ENDING 30TH SEPTEMBER, 1891.

1890.	RECEIPTS.	£	s.	d.
Sept. 30.	Balance in Hand	4	8	7
	Subscriptions	7	10	0
		11	18	7
	Royal Society	7	10	0
		£19	8	7

PAYMENTS.	£	s.	d.
Magazines	0	13	0
Binding Magazines	1	10	0
Printing Annual Report	1	5	0
Post Cards and Printing same	1	8	0
Postage	0	9	2
Caretaker	1	6	0
1½-in. Objective	1	15	0
	8	6	2
Royal Society Subscriptions	7	10	0
Balance in Hand	3	12	5
	£19	8	7

Audited and found correct,

C. C. PRESGRAVE, Auditor.

W. B. POOLE, Chairman.

J. W. BUSSELL, Hon. Secretary and Treasurer.

GENERAL INDEX.

[The species and genera, the names of which are printed in italics, are described as new.]

Aborigines of the Finke River-basin, 217; of the MacDonnell Ranges, 1.
Adamson, D. B., on Photographing the Solar Eclipse, 61; Obituary Notice of, 365.
Address, Presidential, 368
Adelaidia rigua, 130.
Æthinodes marmoratum, 109.
Agarista *platyxantha*, 194; *tetrapleura*, 195.
Agrilus *Frenchi*, 302
Allelidea *viridis*, 302.
Analysis of Volcanic Ash, 256.
Anatomy of Notoryctes typhlops, 283.
Anilaria *angustata*, 296; *laeta*, 297; *soror*, 296; *subcostata*, 296.
Anaxo *æreus*, 308; *affinis*, 309; *ater*, 310; cylindricus, 309; *Lindensis*, 309; *occidentalis*, 311; puncticeps, 311; *sparsus*, 310.
Annual Report of Field Naturalists' Section, 389; Microscopical Section, 393; Royal Society, 364.
Anobium domesticum, 307; panicum, 306.
Anthrenus *Flindersi*, 132; *ocellifer*, 132.
Apellatus *modicornis*, 314; *nigricornis*, 315.
Atænius Palmerstoni, 135; *speculator*, 135.
Atomaria *australis*, 119; *Lindensis*, 119.
Atractocerus *Victoriensis*, 306.
Australian Coleoptera, 65, 292; Echinoids (Eocene), 279; Foraminifera (Tertiary), 346, 350, 355; Fungi, 55; Lepidoptera, 188; Mollusca, 257.
Barycistela robusta, 328.
Bibliography of Australian Eocene Echinoids, 270.
Blackburn, T., on New Australian Coleoptera, 65, 292.
Bledius *infans*, 76; *insignicornis*, 75; *Ovensensis*, 76.
Bombyx *mioleuca*, 190.
Bothrideres merus, 118; *Victoriensis*, 117.
Broken Hill Mines, Water Supply for, 200.
Bryaxis *Harti*, 78; *inusitata*, 79; *Lindensis*, 77: *Ovensensis*, 80; *paludis*, 81.
Bubastes laticollis, 294; *occidentalis*, 293; *splendens*, 294.
Byrrhus *raucus*, 133.
Cædiomorpha australis, 139.
Callipyris drosera, 195.
Cardiaster *latecordatus*, 280.
Central Australia, Aborigines of, 1, 217; Geology of, 247; New Marsupial from, 154, 283.
Chalcophora *Frenchi*, 136.
Chewings, C., On the Geology of the Finke River-basin, 247.
Chlamydopsis *inæqualis*, 94; *sternalis*, 93.
Choleva *Adelaidæ*, 37; *antipodum*, 87; *minuscula*, 88; *Victoriensis*, 88.
Cholevomorpha picta, 89.
Chromomæa *maculicornis*, 315; *rufipennis*, 316.
Cis *Victoriensis*, 308.
Cisseis *bella*, 298; *dispar*, 297; *perplexa*, 300; *pygmæa*, 299; *verna*, 299.
Clathrus Tepperianus, Systematic Position of, 60.
Climate of the Upper Finke River-basin, 212.
Coleoptera, New Species and Genera of, 65, 292.
Corœbus *pilosicollis*, 301.
Cormodes constricta, 303.
Corticaria *Adelaidæ*, 120; *alutacea*, 121; *Andersoni*, 121; *australis*, 120; *Lindensis*, 120.
Cossus *Edwardsi*, 63.
Crassatella *carnea*, 263.
Crawford, F. S., Obituary Notice of, 364.
Cretaceous Rocks of the Finke River-basin, 253.
Crobenia *Eyrensis*, 305.
Cryptophagus *Lindensis*, 119.
Cryptorhopalium *Australicum*, 130; *interioris*, 131; *Woodvillense*, 130.
Ctenistes *Andersoni*, 77.
Darala *asterias*, 192; *protocentra*, 191; *xantharcha*, 191.
Devonian Rocks of the Finke River-basin, 251.
Diala *magna*, 259.
Dicrochile *ventralis*, 65.
Diplocœlus *angustulus*, 122; *exiguus*, 123.
Disoderes *torridus*, 301.
Ditoma *nivicola*, 114; *torrida*, 114.
Dixon, S., On a Subterranean Water Supply for Broken Hill, 200.
Domene *Torrensensis*, 75.
Dryophilodes australis, 307; *insignis*, 307.
Echinobrissus *Vincentianus*, 280.
Echinoids of the Australian Eocene, 270.
Eclipse of the Sun, December 12, 1890, 61.
Edusa *ænea*, 146; *bella*, 148; chrysura, 143; *distincta*, 146; *diversicollis*, 144; *fraterna*, 150; *Froggatti*, 145; *glabra*, 152; *glauca*, 149; *hirta*, 150; *inermis*, 151; *lata*, 148; *lineata*, 147: *Meyricki*, 151; *minor*, 146; *pavens*, 151; *perplexa*, 147; *pilifera*, 149; *singularis*, 152; *spinicollis*, 145; *varians*, 144.
Elaphristis anthracia, 198.
Emydura latisternum, 362.
Eocene Echinoids, 270; foraminifera, 350.
Ephippodonta McDougalli, 267.
Eupatagus *decipiens*, 282.
Eupines *militaris*, 84; *nauta*, 83; *nautoides*, 84; *relicta*, 292; *sororcula*, 82; *spiniventris*, 84.
Fabularia *Howchini*, 347.
Finke River-basin, Aborigines of, 217; Climate of, 212; Fossils from, 255; Geology of, 247; Language of the Natives of, 1; Natural Products, 214; Physical Features of, 210.

Foraminifera, Eocene Species of, 352; New Species of, 347, 355.
Fossil-mollusca, New Species of, 261.
Fossils, Silurian of the Finke River-basin, 255.
Fungi, Australian, List of, 55.
Geology of the Finke River-basin, 247.
Grammar of Aboriginal Language, 1.
Habits of Notoryctes typhlops, 283.
Haptoncura *Lindense*, 103; *Meyricki*, 104; *uniformis*, 104; *Victoriense*, 103.
Hemicistela discoïdalis, 332.
Heterocerus *indistinctus*, 134; *Victoriæ*, 133.
Heterothops taurus, 69.
Homotrysis *fusca*, 326; *limbata*, 323; *lugubris*, 322; *nitida*, 326; *princeps*, 325; *rufa*, 324; *ruficornis*, 322; rugulosa, 323; *tenebrioides*, 325.
Howchin, W., On the Foraminifera of the Older Tertiary, 350, 355.
Hyperomma lacertinum, 71.
Hypharpax *Sloanei*, 65.
Idaethina *cincta*, 107.
Kellia rotunda, 267.
Kempe, H., On the Language of the Aborigines of Central Australia, 1.
Kent Town-bore, Foraminifera of, 352.
Laccobius *australis*, 67; *montanus*, 67.
Laelia *eremœa*, 193.
Lamellibranchs of S. Australia, List of, 265.
Language of Central Australian Natives, 1.
Lasiodactylus marginatus, 106.
Lathrobium *Victoriense*, 71.
Latirofusus *nigrofuscus*, 258.
Leda *Verconis*, 264.
Leiopyrga cingulata, 260; *octona*, 260; picturata, *quadricingulata*, 261; *Sayceana*, 261.
Lepidoptera, New Species of, 63, 188.
Lindia angustata, 139.
Lissodema *frigidum*, 335.
List of Fellows, &c., 385.
Lithocharis *varicornis*, 72.
Litochrus alpicola, 98; *alternans*, 95; *frigidus*, 97; *laeticulus*, 95; *lateralis*, 97; *maculatus*, 96; *Palmerstoni*, 95; *suturellus*, 96; *uniformis*, 98.
Lucinopsis *pellucida*, 263.
Ludwig, F., On Australian Rusts and Smuts, 55.
Lutraria oblonga, 266.
MacDonnell Ranges, Aborigines of, 1, 217; Rocks and Fossils of, 247.
Macratia *Victoriensis*, 336.
Macroura Baileyi, 108; *deceptor*, 108.
Mæchidius *pilosus*, 293.
Marsupialia, New Genus of, 154.
Melobasis *bicolor*, 295; *pulchra*, 294.
Meryx *æqualis*, 115.
Mesozoic Rocks of the Finke River-basin, 253.
Metabasis *variegata*, 304.
Meyrick, E., On New Australian Lepidoptera, 188.
Miocene Foraminifera, 347, 355.
Modiola arborescens, 268.
Momopola miltogramma, 190.
Mollusca, New Species of Australian, 257.
Mordella *Baldiensis*, 341.
Muddy Creek, Foraminifera from, 347, 352, 355.
Mycetæa *pilosella*, 122.
Natural Products of the Finke River-basin, 214.
Neaspis *pusilla*, 112.
Neosalpingus corticalis, 334; *dentaticollis*, 334.
New Hebrides, Analysis of Volcanic Ash from, 256.
Nitidula quadripustulata, 105.
Nocar debilis, 329; *latus*, 329; *simplex*, 330.
Notoryctes typhlops, 154; Further Notes on, 283.
Notosalpingus ornatus, 333.
Ocneria *heliaspis*, 192
Older Tertiary, Foraminifera of, 347, 352.
Olibrus *Victoriensis*, 101.
Ommatophorus Mastersi, 335.
Ooraminna Sandstone, 251.
Orcus *cœlestris*, 153.
Orophius *dilutipes*, 308.
Pæderus *Meyricki*, 72.
Paracephala *æmea*, 202,
Paracymus *nigerrimus*, 66.
Parapylus bicinctus, 305.
Parasitic Fungi of Australia, 55.
Paussus *australis*, 68.
Pectunculus Gealei, 268; *sordidus*, 264.
Pellonyxa *australis*, 113; *pubescens*, 113.
Perameles Gunnii, 360.
Phacodes *bellus*, 343, *marmoratus*, 344; *validus*, 342.
Phalacrinus australis, 99; *obtusus*, 100; *rotundus*, 100.
Phalacrus *Burrundiensis*, 101.
Photography of the Solar Eclipse of December 12, 1890, 61.
Physical Features of the Finke River-basin, 210.
Platydema *Championi*, 139.
Porthasia *anacausta*, 193; *hololeuca*, 193; *iobrota*, 194; *pyraustis*, 194.
Prasonotus *Chapuisi*, 139.
Presidential Address, 368.
Pre-Silurian Rocks of the Finke River-basin, 247.
Pseudocistela ovalis, 317.
Pylus *pygmœus*, 306.
Quedius cuprinus, 69; taurus, 69.
Rennie, E. H., and Turner, Analysis of Volcanic Ash, 256.
Rhabdogonium *exsculptum*, 355.
Rivula niphodesma, 197.
Rusts of Australia, List of, 55.
Salenia *globosa*, 279.
Sarrotrium *australe*, 115.
Scaletomerus harpaloides, 330; *proximus*, 331.
Scaphidium *alpicola*, 90.
Scaphisoma *novicum*, 91.
Schizaster *abductus*, 281.
Schlumberger, M. C., On a New Species of Fabularia, 346.
Schomburgk, Dr. R., Obituary Notice of, 364.
Schulze, L., On the Aborigines of the Finke River-basin, 210.
Scopæus *dubius*, 73; *obscuripennis*, 73.
Scutellina *patella*, 279.
Semele *monilis*, 261.
Silvanus armatulus, 118; monticola, 118.
Silurian Rocks of the Finke River-basin, 249; Fossils of, 255.
Siphonalia dilatata, 257; *oligostira*, 258; sulcata, 257; Tasmaniensis, 257.
Smuts of Australia, List of, 58.
Solar Eclipse of December 12, 1890, 61.
Soronia *simulans*, 105.
South Australian Lamellibranchs, 265; Natives, 1, 210; Tortoises,
Sparactus *costatus*, 117; *elongatus*, 116; *proximus*, 116; *pustulosus*, 116.

Stigmodera *princeps*, 137 ; *rectipennis*, 138 ; *tibialis*, 137.
Stirling, E. C., On a New Genus of Marsupialia, 154 ; Further Notes on Notoryctes typhlops, 283.
Subterranean Water-supply for Broken Hill, 200.
Synemon *austera*, 189 ; *brontias*, 189 ; *heliopis*, 188 ; *leucopsila*, 188.
Syzeton lætus, 337 ; *lateralis*, 337.
Syzetonellus alpicola, 340.
Syzetoninus inconspicuus, 339 ; *mundus*, 339.
Tachinus *novitius*, 68.
Tanna, Analysis of Volcanic Ash from, 256.
Tarsostenus univittatus, 303.
Tate, R., Australian Tertiary Echinoids, 270 ; Supplementary List of S. Australian Lamellibranchs, 265 ; New Species of Recent and Fossil Mollusca, 257 ; Silurian Fossils from Central Australia, 255.
Tellina *modestina*, 266 ; *Vincentiana*, 262.
Tepper, J. G. O., On a New Species of Cossus, 63.
Tertiary Rocks of the Finke River-basin, 253.
Thalpochares *basilissa*, 196 ; *chrysaspis*, 197 ; *pyraspis*, 196.
Thalycrodes australe, 110 : *cylindricum*, 112 ; *pulchrum*, 111.
Thanasimomorpha intricata, 304.
Tortoises of S. Australia, List of, 362.
Trichananca Victoriensis, 341.
Trichosalpingus brunneus, 333.
Triphyllus *intricatus*, 122.
Trogodendron ephippium, 303.
Trogoderma *Adelaidæ*, 125 ; *alpicola*, 124 ; *antipodum*, 128 ; *Baldiense*, 127 ; *difficile*, 126 ; *Eyrense*, 124 ; *Lindense*, 125 ; *Macleayi*, 126 ; *Meyricki*, 128 ; *occidentale*, 127 ; *singulare*, 128 ; *Yorkense*, 127.
Truncatulina margaritifera, var. *Adelaidensis*, 352.
Turner, E. F., and Rennie, Analysis of Volcanic Ash, 256.
Uridineæ of Australia, List of, 56.
Urostola magica, 199.
Ustilagineæ of Australia, List of, 58.
Vocabulary of Central Australian Natives, 37.
Volcanic Ash from New Hebrides, Analysis of, 256.
Water-supply for Broken Hill, 200.
Xenithicola crassus, 303 ; sosius, 303.
Zietz, A., List of S. Australian Tortoises, 362.

TRANSACTIONS AND PROCEEDINGS

AND

REPORT

OF THE

ROYAL SOCIETY of SOUTH AUSTRALIA.

VOL. XV.

For 1891-92.

EDITED BY PROFESSOR RALPH TATE.

Adelaide:

W. C. RIGBY, 74, KING WILLIAM STREET.

DECEMBER, 1892.

Parcels for transmission to the Royal Society of South Australia, from Europe and America, should be addressed "per W. C. Rigby, care Messrs. Thos. Meadows & Co., 35, Milk Street, Cheapside, London."

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[Elected October 4, 1891.]

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CONTENTS.

PART I. (Issued July, 1892.) PAGE.

HOLTZE, M. : Introduced Plants in the Northern Territory 1

LOWER, OSWALD B. : Descriptions of New South Australian Lepidoptera 5

ZIETZ, A. : List of South Australian Species of Kangaroos and Wallabies 18

BLACKBURN, REV. T. : Descriptions of New Genera and Species of Australian Coleoptera 20

BRAGG, PROF. W. H. : The Energy of the Electromagnetic Field ... 74

TEPPER, J. G. O. : The Phaneropteridæ of Australia and Polynesia ... 77

HOLTZE, M. : Narrative of an Exploring Tour across Melville Island, N. Australia, with Notes on its Botany 114

PART II. (Issued December, 1892.)

RAVENSCROFT, A. G. B. : Some Habits and Customs of the Chingalee Tribe 121

PRIESTLY, P. H. : Notes on Glacial Phenomena about Mount Gambier 123

TATE, PROF. R. : Descriptions of some New Species of Marine Mollusca from Australia (plate i.)... 125

TATE, PROF. R. : A Third Supplement to a List of the Lamellibranch Mollusca of South Australia 133

TEPPER, J. G. O. : The Gryllacridæ and Stenopelmatidæ of Australia and Polynesia 137

PRITCHARD, G. B. : On the Cambrian Rocks at Curramulka 179

TATE, PROF. R. : The Cambrian Fossils of South Australia (plate ii.) 183

TATE, PROF. R. : Critical Remarks on A. Bittner's "Echiniden des Tertiars von Australien" 190

DIXON, SAMUEL : The Effects of Settlement and Pastoral Occupation in Australia upon the Indigenous Vegetation 195

BLACKBURN, REV. THOMAS : Descriptions of New Genera and Species of Australian Coleoptera 207

PAGE.

MISCELLANEOUS CONTRIBUTION.

Plants Collected in the Northern Territory by Dr. E. C. Stirling.—Professor R. Tate 262

BIBLIOGRAPHY.

New South Australian Fungi, by Dr. Ludwig 263

New Species of Drosera (*D. praefolia*), by Mr. J. G. O. Tepper ... 263

Abstract of Proceedings 264

Annual Report 269

Balance-sheet 272

Donations to the Library 273

List of Fellows 281

APPENDICES.

Proceedings, Annual Report, and Balance-sheet of the Field Naturalists' Section 284

Annual Report and Balance-sheet of the Microscopical Section ... 288

Introduced Plants in the Northern Territory.

By Maurice Holtze, F.L.S.

[Read November 3, 1891.]

The object of my paper is only to record those plants which in the Northern Territory have, up to date, escaped from cultivation, or which have been introduced unintentionally. Some of them have already identified themselves so thoroughly with their new home that a collector, not conversant with their history, will unhesitatingly consider them as part of the indigenous flora. In a few instances plants, naturally wild in North Australia, have been introduced in a cultivated form, and these cultivated plants, escaped from cultivation, may mislead the collector considerably.

In most cases the plants enumerated have been introduced during my residence in the Territory; others I have seen, so to say, in their infancy, and a few may be said to be, for me, prehistoric. Of these latter, two, *Tamarindus Indicus*, Lin., and *Hyptis suaveolens*, Poit., have been included in the Flora Australiensis, but I fear I must, nevertheless, deny them the right to be called truly indigenous. *Tamarindus Indicus* is only to be found on the North Coast, at places which have been visited by Malay-prows for many years past, and as the fruit of the tamarind forms part of the daily food of the Malays, there can be no doubt that this plant has been introduced by them. *Hyptis suaveolens* was found by Leichhardt at Port Essington, and is found there only within a limited radius of the old settlement, while at Port Darwin, where it was introduced about 20 years ago by a Mr. Schmidt, from Timor, I have been able to watch its spread in the wake of settlement.

I come now to the other plants, introduced by the old settlers at Port Essington. They are:—

Capsicum frutescens, Lin.
Moringa pterygosperma, Gaertn.
Mangifera Indica, Lin.
Guazuma tomentosa, H. & B.

I may say that other plants introduced here may have escaped my observation.

Next we come to those plants introduced within the last 20 years. These are comparatively numerous, and some of them have already overrun the country to such an extent as to become troublesome pests. Some of them, it is true, are useful fodder

plants, others are, in their cultivated state, of great commercial value, such as cotton, indigo, and indiarubber, but others again, as, for instance, *Hyptis suaveolens* and *Passiflora fœtida*, are exterminating the native vegetation wherever they have taken root, by their almost incredible luxuriance. *Passiflora fœtida*, although introduced hardly ten years ago, is suffocating already, to a great extent, the undergrowth of the forest near Fannie Bay, and as the fruit is relished by birds and natives, this plant promises to become a great nuisance.

I will now enumerate the plants introduced during the last 20 years :—

Papaveraceae.

Argemone Mexicana, *Lin.*

Capparideae.

Cleome uniglandulosa, *Cavan.*

Malvaceae.

Hibiscus Sabdariffa, *Lin.*
Gossypium herbaceum, *Lin.*
Gossypium Barbadense, *Lin.*

Oxalideae.

Oxalis corniculata, *Lin.*
Oxalis Valdiveana, *Bernard.*

Meliaceae.

Melia Azedarach, *Lin.*

Rhamnaceae.

Ziziphus Jujuba, *Lam.*

Leguminosae.

Indigofera Anil, *Lin.*
Indigofera tinctoria, *Lin.*
Clitorea ternatea, *Lin.*
Phaseolus atropurpureus, *Sesse.*
Cajanus Indicus, *Sprengl.*
Cassia alata, *Lin.*
Mimosa rubricaulis, *Lam.*
Mimosa pudica, *Lin.*
Acacia Arabica, *Willd.*
Acacia leucocephala, *Bertero.*
Desmodium gyrans, *DeC.*

Passifloreae.

Passiflora fœtida, *Cavan.*, var. pectinata.

Compositae.

Ageratum Mexicanum, *Sweet.*
Zinnia elegans, *Hort.*
Zinnia verticillata, *Andr.*

Calliopsis bicolor, *Reihbch.*
Calliopsis cardaminæfolia, *DeC.*
Gaillardia picta, *Hort.*
Tagetes patula, *Lin.*
Cacalia sonchifolia, *Wall.*
Sonchus oleraceus, *Lin.*

Apocyneae.

Vinca rosea, *Lin.*, var. alba.

Asclepiadeae.

Asclepias Curassavica, *Lin.*

Convolvulaceae.

Ipomœa sinuata, *Ortega.*
Ipomœa Quamoclit, *Lin.*
Ipomœa aquatica, *Forsk.*

Solanaceae.

Nicandra physaloides, *Gaertn.*
Datura fastuosa, *Lin.*
Datura Stramonium, *Lin.*
Datura inermis, *Tayu.*

Scrophularineae.

Torenia Fournieri, *Lindl.*

Pedalineae.

Sesamum orientale, *Lin.*

Verbenaceae.

Verbena Bonariensis, *Lin.*
Lantana hybrida, *Hort.*
Stachytarpheta mutabilis, *Vahl.*
Stachytarpheta Jamaicensis, *Vahl.*

Labiatae.

Salvia coccinea, *Lin.*
Leonotis nepetæfolia, *R. Br.*

Phytolaccaceae.

Rivina humilis, *Lin.*

Amarantaceae.

Celosia cristata, *Lin.*
Amarantus viridis, *Lin.*
Amarantus oleraceus, *Lin.*
Amarantus melancholicus, *Lin.*
Gomphrena globosa, *Willd.*

Euphorbiaceae.

Ricinus communis, *Lin.*
Manihot Glaziovi, *J. Mueller.*

Gramineae.

Andropogon Schimperi, *Hochst.*
Tricholæna rosea, *Nees.*
Sorghum vulgare, *Pers.*
Panicum maximum, *Tayu.*
Eleusine caracana, *Pers.*
Eleusine oligostachya, *Link.*
Eragrostis elegans, *Nees.*

There is, of course, with many of these plants no fear that they may be taken as indigenous; but others—for instance, *Eleusine*, *Eragrostis*, *Panicum*, and *Andropogon*, which are represented in numerous species in North Australia—will easily be collected as truly indigenous.

I come now to a few plants which, although truly indigenous in North Australia, have been introduced in a cultivated state, and have escaped from cultivation. These plants are :—

Corchorus capsularis, *Lin.*
Crotolaria juncea, *Lin.*
Acacia Farnesiana, *Willd.*
Oryza sativa, *Lin.*
Sorghum Haleppense, *Pers.*

We all know that plants alter much by cultivation, and in these cases also there is no mistake possible if the presence of introduced plants is once recorded. In conclusion, I will draw your attention to the fact that *Oryza sativa* is found truly wild only in Arnheim Land. The same can be said of *Phaseolus vulgaris*, Lin., *Dolichos uniflorus*, Lam., and *Dioscorea sativa*, Lin. Is, then, Australia the home from where these plants have been introduced to India and other countries many centuries before our times? or has Australia been connected with Asia in prehistoric ages? Geologists tell us that we inhabit the remnant of the oldest continent; flora and fauna contain the nearest allies to antediluvian formations. Can it then be possible that the beastlike Autochthone Australian has been the ancestor of the human family? I must leave it for abler thinkers to solve this problem.

Descriptions of New South Australian Lepidoptera.

By Oswald B. Lower.

[Read March 1 and June 7, 1892.]

HEPIALIDÆ.

Hepialus, *F.*

Hepialus (Charagia) Blackburnii, sp. nov.

Female, 75 mm. Head and palpi yellowish-green. Antennæ dark red. Thorax yellowish-green. Abdomen salmon-pink, three posterior segments greenish-yellow; abdomen beneath ochreous-whitish. Legs yellowish-green, anterior and middle tibiæ and tarsi dark red, posterior tibiæ and tarsi salmon-pink. Forewings elongate triangular; costa straight, slightly arched at apex, apex round-pointed; hindmargin nearly straight, oblique; light yellowish-green, golden tinged; markings ferruginous; a small basal spot; five subquadrate spots on costa at almost equal distances, extending from one-fifth to two-thirds, posterior smallest; inner marginal edge ferruginous, with two irregular sub-triangular patches, first at one half, second at two-thirds; obliquely beyond first is a wedge-shaped spot; an irregular series of six spots proceed from second patch directly towards apex, but not near reaching it: cilia ferruginous, tips paler, with an undulating basal line. Hindwings salmon-pink; cilia paler, with a much darker parting-line. Underside of all wings salmon-pink, suffused with greenish, more especially towards hindmargin of forewings and costa of hindwings.

For my type of this rare and beautiful insect I am indebted to the Rev. Thos. Blackburn, of Woodville, to whom I have great pleasure in dedicating it.

The present species is nearest *Hep. Scottii*, but is much smaller. One specimen from Port Lincoln, South Australia.

Hectomanes, *Meyr.*

Hect. pteromela, sp. nov.

Male, 26-29 mm. Head, thorax, and legs blackish-fuscous. Antennæ ochreous-fuscous. Abdomen lighter fuscous. Forewings dark-fuscous, rather lighter towards hindmargin: costa blackish towards base; a moderate well-defined white longitudinal streak from base almost to hindmargin, suffusedly margined on both sides with blackish: from extremity of streak proceeds

to apex two or three blackish dots indistinctly ringed with whitish; a hindmarginal row of similar dots; a few blackish marks on middle of inner margin: cilia fuscous mixed with paler, with an indistinct basal line. Hindwings dark fuscous: cilia paler, with a darker basal line.

Two specimens, at light, Parkside, in April, 1892. A very distinct species, not approaching any other; the longitudinal streak distinguishes it immediately.

HECT. SIMULANS, *Walker*.

One fine female taken at Blackwood in April, not previously recorded from South Australia.

HECT. NOSERODES, *Meyr*.

One specimen, a female, taken at Blackwood Railway Station (at light) in April, 1892, not previously recorded from South Australia.

HECT. POLYSPILA, *Meyr*.

One male specimen taken at Parkside (at light) April, not previously recorded from South Australia.

HECT. COMPSENTA, *Meyr*.

Five specimens, at Blackwood, in April and May.

ARCTIADÆ.

TERMESSA, *Walker*.

TERM. XANTHOMELAS, sp. nov.

Male, 28-31 mm. Head ochreous-yellow. Palpi deeper ochreous-yellow. Thorax ochreous-yellow, with a rather broad blackish anterior transverse band; shoulders broadly black. Antennæ black, becoming ochreous towards tips. Abdomen deep ochreous-yellow, posterior segments delicately margined with fuscous. Anterior and middle legs blackish, coxæ yellow, posterior legs ochreous-yellow, slightly infuscated. Forewings elongate triangular, costa moderately arched, apex obtuse, hindmargin somewhat obliquely rounded; ochreous-yellow, with black markings; a short longitudinal streak on costa near base, posteriorly suffused and continued very narrowly on costa to first fascia; a rather broad irregularly-edged fascia from one-third of costa to one-third of inner margin, broadly dilated on inner margin; a similar fascia from two-thirds of costa to anal angle, broadly dilated on costa, almost touching apex; a dentate hindmarginal band, which is inclined to separate into six spots: cilia dark fuscous, tips lighter. Hindwings ochreous-yellow; a blackish spot near apex; a small (variable in size) black dot at anal angle: cilia ochreous-yellow, fuscous at apex, and beneath minute dot ochreous-yellow.

Allied to *Term. congrua*, Walker, but differs in cilia of the forewings, and is without the entire blackish hindmarginal band of hindwings; in other respects it is superficially similar. The present species and *congrua* are the only two with yellow palpi.

Two specimens at Waterfall Gully on October 27th, 1890.

TERM. NIVOSA, *Walker.*

I have taken three specimens of this insect at Littlehampton, in November, from *Acacia pycnantha.*

TERM. ZONOPHANES, *Meyrick.*

I have taken one specimen at Yorketown.

MONOCTENIADÆ.

MONOCTENIA, *Gn.*

MONOCTENIA EXIMIA, sp. nov.

Female, 65 mm. Head ochreous-whitish, face deep purplish-crimson. Palpi purplish-crimson, terminal joint ochreous-tinged. Thorax and abdomen pale pinkish, thorax beneath very woolly, pale pink, anteriorly dark purplish-crimson. Antennæ ochreous. Anterior legs dark crimson-purple with whitish apical joints, middle pair paler (posterior pair broken). Forewings elongated triangular, costa straight, apex acute, hindmargin strongly bowed, crenulate; rosy purplish-ochreous; a rather broad pale pinkish or flesh-coloured costal streak from base to near apex, posteriorly attenuated; cilia blackish, with a pinkish basal line. Hindwings rosy purplish-ochreous, base much paler; cilia blackish, with a pinkish basal line.

Intermediate between *smerintharia*, Felder, and *calladelpha*, Lower; but is immediately known by the costal streak.

Port Lincoln; one specimen.

MON. CALLADELPHA, sp. nov.

Male, 60-65 mm. Head pale fleshy-ochreous, face deep purplish-ferruginous. Palpi above deep purple-ferruginous, beneath pale fleshy-ochreous, terminal joint deep purple-ferruginous. Thorax and abdomen pale fleshy-ochreous, abdomen with lateral tufts. Thorax beneath very woolly, dark crimson-purple anteriorly, lighter posteriorly. Antennæ ochreous. Legs pale fleshy-ochreous; tibiæ and tarsi much darker. Forewings elongated triangular; costa straight, hindmargin very strongly bowed, crenulate; rosy purplish-ochreous, without markings, all veins tending to become yellowish; cilia yellowish-ochreous with purplish fuscous spots on veins. Hindwings purplish, suffused with rosy, much paler towards base and inner margin; an indistinct curved pale

whitish band from costa at two-thirds to inner margin at three-fifths ; cilia and spots as in forewings.

Intermediate between *falernaria*, Gn., and *smerintharia*, Felder, but differs from both through absence of markings of forewings.

One specimen from Port Lincoln and one specimen at light at Parkside on April 17, 1890.

Mon. falernaria, *Gn.*

I have one specimen (male) from Port Lincoln. Taken by Rev. Thos. Blackburn.

Mon. vinaria, *Gn.*

I have two specimens from Reedbeds and two from Blackwood, taken in March, 1890, and February 27, 1891, beaten from dry bush, also one from Belair, taken November 3, 1891.

Dichromodes, *Guenee.*

Dich. ptilomacra, sp. nov.

Male and female, 26 mm. Head and thorax whitish, irrorated with dark-fuscous. Palpi 6 to 8, whitish, strongly irrorated with rough dark-fuscous scales, beneath darker, at base and towards apex whitish. Antennæ whitish, sharply annulated with dark-fuscous, pectinations nearly 12. Abdomen whitish-ochreous. Legs fuscous, posterior pair whitish, tarsi infuscated. Forewings triangular, costa arched towards base, hindmargin bowed ; fuscous densely irrorated with whitish, and with scattered darker fuscous scales ; four small slightly raised tufts of raised scales, black edged with white ; first at one-fourth beneath costa, second in disc before middle ; third in disc above middle ; fourth on inner margin at about one-fourth ; above the third tuft is a linear cheese-coloured streak, obscurely edged above with whitish ; first line whitish from one-fourth of costa, angulated outwards so as to touch first and second tufts and ending on fourth ; a straight white line from costa at three-fourths to near anal angle, sharply dentate throughout, edged anteriorly with blackish ; a broad cheese-coloured streak from the dentate line to second tuft; another similar streak from the line parallel with inner margin nearly to base ; these streaks are separated by streaks of ground-colour of about the same width ; a broad cheese-coloured streak from apex to anal angle, suffusedly irrorated with whitish on costa ; subterminal line white, straight, slightly dentate ; veins between this and hindmargin streaked with cheese-colour ; a waved blackish interrupted hindmarginal line : cilia whitish-fuscous, very distinctly barred with black and white, especially on underside. Hindwings fuscous-grey, darker posteriorly ; a

darker hindmarginal line: cilia fuscous-grey, basal-half slightly darker.

Blackwood; four specimens, 8th December.

The most remarkable of the genus, nearest *D. steropias*, Meyr., but differs in length of palpi, and especially antennal pectinations of male; the antennæ are also sharply annulated, the streaks of cheese-colour are also conspicuous characters. In addition to the above I have taken the following species:—

Dich. ainaria, *Gn.* Blackwood and Highbury. Common.

Dich. anelictis, *Meyr.* Blackwood and Highbury. Common.

Dich. obtusata, *Walk.* Blackwood; common. Highbury; scarce.

Dich. explanata, *Walk.* Teatree Gully and Blackwood. Several specimens.

Dich. sigmata, *Walk.* Two specimens. Highbury.

Dich. orectis, *Meyr.* Highbury and Blackwood. Several specimens.

Dich. consignata, *Walk.* Two specimens—one at Clarendon, one at Highbury.

Dich. stilbiata, *Gn.* Two specimens. Clarendon.

BOARMIADÆ.

Stibaroma, *Meyrick.*

Stib. trigramma, sp. nov.

Male, 35 to 40 mm. Head, palpi, and thorax ashy grey-whitish; thorax with a black transverse line, interrupted in middle. Antennæ whitish, pectinations reddish-fuscous. Abdomen white, base of segments broadly black. Anterior and middle legs blackish, ringed with white; posterior pair whitish, slightly infuscated; tarsi with whitish apical rings. Forewings elongated triangular, costa gently arched, apex round-pointed, hindmargin waved, bowed, oblique; ashy grey-whitish, minutely irrorated with black; a black suffusion at base; a reddish-ochreous spot not touching inner margin or base immediately beneath this; three black transverse lines; first from one-fourth of costa to one-third of inner margin, acutely angulated inwards near inner margin; second somewhat suffused from near one-half of costa to beyond one-half of inner margin, angulated outwards in middle; a transverse black discal dot; third line from three-fourths of costa to three-fourths of inner margin, strongly angulated throughout, with a bidentate projection outwards in middle, sometimes obscurely edged with whitish; a reddish-ochreous suffusion near anal angle, and another resting on projection above middle; a white dentate subterminal line; sometimes the median vein and three branches are strongly outlined with black as far as

this line; hindmarginal line waved: black; cilia ashy grey-whitish: base whiter, with black spots at extremities of veins. Hindwings rounded; slightly sinuate beneath apex and at anal angle; whitish; a black linear discal dot; a blackish submarginal line; a broad black hindmarginal band, broader at apex: cilia white, with black dots at extremities of veins.

Female, 40 to 45 mm. Differs only from male in having first line edged anteriorly with whitish; the second one almost obsolete, and the third more distinctly edged with whitish. The reddish-ochreous suffusions are almost obliterated, and the hindmarginal bands of the hindwings are much paler.

Blackwood; twenty-five specimens early in May and June, beaten from the so-called stringybark. The insects frequent only the tallest trees, and are very sluggish, and generally fall straight to the ground when beaten out.

ŒCOPHORIDÆ.

Palparia, *Wing.*

Palparia leucosta, sp. nov.

Male, 15 mm.; female, 22 mm. Head light brownish-fuscous, face lighter. Antennæ light-fuscous, base whitish. Palpi with second joint dense, broadly triangular, whitish-ochreous, strongly carmine tinged beneath, terminal joint short. Thorax bright carmine-pink, finely sprinkled with slaty-fuscous; anteriorly rather broadly suffused with light brownish-ochreous. Abdomen dark fuscous, margins of segments pale whitish with silvery reflections, anal tuft of female pale ochreous. Anterior and middle legs dark fuscous, slightly sprinkled with whitish; posterior legs pale ochreous-whitish. Forewings moderate, costa evenly arched, apex acute, very slightly produced; hindmargin sinuate beneath apex, thence obliquely rounded; bright carmine-pink, minutely irrorated with slaty-fuscous, more especially on middle of disc and middle of inner margin, where it tends to form indistinct patches; costal edge narrowly ochreous-whitish from base to two-thirds, attenuated posteriorly; an ochreous-white straight streak running from fold at two-thirds to anal angle, attenuated anteriorly; inner margin edged with ochreous-whitish more strongly at base: cilia slaty-grey with silvery reflections, darker at apex, where the ground-colour has a tendency to go through it. Hindwings dark fuscous, darker towards apex; cilia lighter.

Nearest *Palp. eonephella*, Meyrick, and *Palp. theophila*, Meyrick; but differs from both by the fuscous hindwings. The fold of the forewings is very strongly produced in the species described.

One specimen (male) on trunk of *Casuarina quadrivalvis* at Baker's Gully, in November; three female specimens from *Leptospermum myrsinoides* at Blackwood, in October and November.

HYDRIOMENIDÆ.

HYDRIOMENA, *Hb.*

HYD. GYPSOMELA, sp. nov.

Male and female, 28-30 mm. Head, palpi, thorax, and abdomen dark fuscous; palpi, one. Legs white, sprinkled with fuscous; tarsi banded with black and white. Forewinge triangular, hindmargin waved, bowed, oblique; white, with ths veins pinkish-tinged, especially near hindmargin, a dark fuscous basal patch from costa at one-sixth to inner margin at one-sixth; outer edge straight; a dark fuscous median band, in male broken; margins black, anterior margin from one-third of costa to one-third inner margin, outwards curved and connected with the basal patch by a streak along costa; an indistinct black discal dot; posterior edge from three-fourths of costa to two-thirds inner margin, with a moderate bidentate projection in middle; a blackish mark on costa before apex, leaving costa whitish; an ill-defined hindmarginal suffusion, in some specimens continued along veins; a blackish hindmarginal line interrupted by veins with coppery fuscous; cilia dark fuscous, base darker. Hindwings light fuscous, in female with a purplish sheen, in male more whitish; an indistinct median band, more defined on inner margin; hindmarginal line and cilia as in forewings.

A very distinct species; the broken band of male may not be a constant character, allowance must be made for this, as I possess but one specimen of that sex taken at Blackwood, and three females taken at Parkside at light.

XANTHORHŒ, *Hubner.*

XANTH. PARADELPHA, sp. nov.

Male, 28-30 mm.; female, 30-32 mm. Head, palpi, thorax, and abdomen fuscous-grey, minutely sprinkled with black; thorax with two more or less distinct transverse black lines. Abdomen with a double series of black dorsal spots. Palpi with the base white, about two. Legs fuscous above, whitish beneath; tarsi ringed with white. Forewings triangular, hindmargin rather waved, slightly bowed, oblique; brownish-ochreous, with cloudy whitish transverse lines; outer edge of basal patch marked with a nearly straight white line; anterior margin of median band marked by a well-defined twice dentate double white line from before one-third of costa to two-fifths of inner margin; posterior

margin from three-quarters of costa to two-thirds of inner margin, edged by a broad well-defined white line, slightly curved near costa and strongly angulated outwards in middle, sometimes interrupted by a fuscous median line, and posteriorly usually edged by a well-defined black line; the median band usually contains an irregular subtriangular patch of lighter ground-colour, edged with darker, and containing a black discal dot; subterminal line dentate, white, slender, nearly straight; hind-marginal line black, slightly interrupted; cilia fuscous, sprinkled with whitish, forming faint bars, terminal-half lighter. Hind-wings with hindmargin rounded, waved, light-fuscous, slightly ochreous tinged; median band of four grey lines, posterior angulated in middle; subterminal line obscurely whitish; hind-marginal line and cilia as in forewings.

Nearest to *vacuaria*, Gn.; but besides differing in the ground colour it may be immediately known by the broad white posterior median line.

Common at Blackwood and at Parkside in February and March; also from Victoria.

XANTH. HYPERYTHRA, sp. nov.

Male, 25 mm.; female, 27-30 mm. Head, palpi, and thorax dark fuscous; head mixed with reddish, terminal joint of palpi whitish, palpi two. Antennæ whitish, pectinations six and eight. Abdomen grey-whitish, minutely sprinkled with fuscous, with a double row of suffused dark fuscous dorsal dots. Legs grey-whitish, slightly infuscated. Forewings triangular, hindmargin slightly waved, bowed oblique; dark fuscous, irregularly irrorated with ochreous-whitish, in some specimens bright golden ochreous; costal edge irregularly strigulated with ochreous-whitish; basal patch indistinct, darker than ground colour; outer edge indicated by a light indistinct line from one-sixth of costa to one-sixth inner margin, curved near costa; median band darker, containing a linear black discal dot, and indications of two or three waved darker transverse lines; anterior edge limited by a whitish interrupted line, distinctly double in some specimens on inner margin, from one-third of costa to one-third inner margin, slightly curved outwards; posterior edge limited by a much more distinct whitish-ochreous line, from two-thirds of costa to two-thirds of inner margin, angulated outwards below costa and at middle; a light suffusion on costa immediately beyond this line; a pale streak from apex nearly to first angulation of posterior line, edged beneath with a fuscous shade; subterminal line whitish, indistinct; all veins near hindmargin suffused with fuscous reddish; a blackish hindmarginal line interrupted by veins: cilia fuscous reddish, terminal half redder, with a paler red line. Hindwings

with hindmargin rounded, waved, greyish, with a reddish reflection, paler towards base; an indistinct median band angulated in middle; hindmarginal line and cilia as in forewings.

Underside— The whole of the underside suffused with dull reddish, more prominent on the veins, less strongly towards inner margin of forewings.

A very variable insect; in some specimens the markings are almost obliterated by the darker ground-colour; the reddish colouring of the underside is a noticeable character.

Blackwood, Highbury, and Parkside, mostly at light; November to March; also from Victoria.

Xanth. xanthospila, sp. nov.

Male, 25 mm. Head, abdomen, and thorax ochreous-whitish, sprinkled with fuscous. Abdominal segments paler, with an indistinct double series of fuscous dorsal spots. Antennæ ochreous-whitish, sharply annulated with black, pectinations about seven, continued to apex. Legs fuscous, tarsi and tibiæ banded with ochreous-whitish. Forewings triangular; hindmargin waved, slightly bowed, oblique; light ochreous-fuscous, with whitish-ochreous markings; a curved blackish line at about one-fifth; median band limited by two well-defined lines; anterior from costa at one-third to one-third inner margin, slightly angulated outwards beneath costa, thence strongly dentate inwards beneath middle, anteriorily margined by a curved series of blackish dots on veins somewhat edged with orange; a black discal dot; median band contains two or three darker lines, especially on costa; posterior from three-fourths of costa to three-fourths of inner margin curved outwardly near costa, and with a strong bidentate projection in middle, and strongly sinuate inwards beneath this so as to nearly touch anterior line; an irregular row of blackish dots anteriorly suffusedly-edged with orange; a subterminal line, well-defined, strongly dentate throughout; a waved slightly interrupted blackish hindmarginal line: cilia ochreous-whitish, basal-half fuscous, with darker spots at extremities of veins. Hindwings with hindmargin rounded, waved; pale whitish-ochreous, slightly fuscous-tinged; a minute blackish discal spot; indications of two or three waved transverse lines; a whitish subterminal line; a blackish waved hindmarginal line, hardly interrupted: cilia as in forewings.

Bears a somewhat superficial appearance to *Hydriomena interrupta*, Gn. Three males at Blackwood in February.

I have also taken:—

Xanth. subidaria, *Gn.* Parkside, Highbury, Blackwood, and Belair.

Xanth. vacuaria, *Gn.* Blackwood and Parkside.

Xanth. extensata, *Walker*. Blackwood.
Xanth. heliacaria, *Gn.* Blackwood. Mostly at light.
Xanth. vicissata, *Gn.* Blackwood.

GEOMETRIDÆ.

Iodis, *Hubner*.

Iodis ipomopsis, sp. nov.

Female, 30-33-40 mm. Head and face green, fillet white. Crown green. Palpi short, carmine, whitish beneath. Antennæ white, terminal half crimson. Thorax green. Abdomen green, sides and apex whitish. Anterior legs light crimson, middle and posterior whitish, somewhat tinged with crimson-fuscous. Forewings with the costa straight, arched towards apex; hindmargin nearly straight, oblique; light bluish-green; costa narrowly pale ochreous-whitish, crimson at base and at apical fourth; lines slender, dentate, whitish; tolerably distinct; first from beneath one-third of costa to one-third of inner margin; a dark green discal dot, sometimes indistinct; second line from two-thirds of costa to two-thirds inner margin; cilia pale crimson, base paler. Hindwings with hindmargin bent on vein 4: first line absent; discal dot, second line, and cilia as in forewings.

Four specimens from Balhannah, and one at Belair, beaten from *Acacia pycnantha* in November. Between *dichloraria*, Gn., and *vertumnaria*, Gn.; but differs from both by its green head and face and absence of dorsal line of thorax, &c.

Hypochroma, *Gn.*

Hypoch. eugramma, sp. nov.

Male, 36 and 38 mm. Head and palpi light grey, terminal joint of palpi black. Antennæ fuscous. Thorax light grey, sprinkled with black and white, with three distinct transverse black lines, one on collar, one anteriorly, and one posteriorly, latter interrupted in middle. Abdomen light grey, segments black, legs black, ringed with white. Forewings triangular. Costa sinuate, apex almost acute, hindmargin obliquely rounded, crenulate; grey, sprinkled with black, with white scales predominating in discal area; lines black, well defined; a transverse streak at base, and another immediately beyond, both straight; first line from before one-third of costa to before one-half of inner margin almost straight, slightly bent in below middle, rather thicker on costa; ground-colour from base to slightly beyond this line smoky grey; a black linear discal streak; second line from about three-fourths of costa to anal angle, strongly curved inwards below middle, posteriorly edged by a fine white line; whole of area beyond this smoky brown, except a fine dentate white line from near apex to

anal angle; hindmarginal line black; cilia alternately grey and white. Hindwings as forewings; basal line indistinct; first line parallel to first line of forewings extending only half across the wing; second line closely beyond this from costa to anal angle, nearly straight; cilia and hindmarginal line as in forewings. Underside—Pale whitish grey, with scattered black scales; a broad black costal streak from base to about one-fourth; a linear discal streak; an outwards curved blackish line from two-thirds of costa towards but not reaching anal angle, posteriorly bounded by a dark smoky shade, enclosing two white teeth before apex. Hindwings as forewings; a transverse discal streak; a broad blackish hindmarginal band, edged anteriorly by a fine black line; posteriorly lighter.

Two specimens taken at light, at Parkside, in February. Very distinct by the well-defined lines; intermediate between *paratorna*, Meyrick, and *diffundens*, Lucas.

XYLORYCTIDÆ.

Cryptophaga, *Lewin.*

Cryptophaga Blackburnii, sp. nov.

Female, 45 mm. Head, palpi, antennæ, and thorax ochreous-whitish; head more ochreous on crown. Abdomen yellowish-grey, second segment dull orange, base of other segments narrowly whitish, suffused above with dull orange (anterior legs broken, middle and posterior whitish-ochreous, tibiæ and tarsi pale crimson. Forewings oblong, posteriorly dilated, costa gently arched, apex obtuse, hindmargin obliquely rounded; 2 from three-quarters; yellowish-grey-whitish, scantily strewn with black scales from base to two-thirds, except along costa; extreme costal edge pale yellowish; a moderate roundish orange spot distinctly edged with minute black scales, in disc beyond one-third; a second more ovate, on fold below middle, and a third more suffused beyond middle, both tending to be suffusedly edged with minute black scales: cilia yellowish-grey-whitish, darker at base. Hindwings grey-whitish, more ochreous-tinged towards base; 6 and 7 from a point; cilia whitish, mixed with fuscous.

One specimen received from Rev. Thos. Blackburn, to whom I have dedicated it; taken at Port Lincoln.

Crypt. ochroleuca, sp. nov.

Male, 45 mm. Head, palpi, thorax, and abdomen whitish-ochreous; base of palpi internally blackish, second segment of abdomen distinct orange-red. Legs ochreous-whitish, anterior and middle distinctly pinkish-tinged above; tarsi black, with white rings at apex of joints. Forewings oblong, posteriorly

somewhat dilated; costa moderately arched, apex obtuse; hindmargin rather obliquely rounded; whitish-ochreous; a black dot in disc at one-third; a second, double, on fold beneath middle, and two others transversely placed, and connected by a fine black line in disc at three-fifths; a row of black spots along hindmargin and apical fourth of costa; 2 from five-sixths; cilia dark fuscous, base somewhat paler, especially towards anal angle. Hindwings and cilia shining white; cilia with black spots at termination of veins, except on anal angle; veins 6 and 7 from a point.

Between *lurida*, Meyr., and *sarcinota*, Meyr.; differs from the former chiefly by the absence of the spots on cilia of forewings, and from the latter by the different ground-colour and other minor points.

One fine specimen from *Eucalyptus sp.* at Blackwood in middle of February.

Crypt. delocentra, *Meyrick.*

Male, 26-30 mm. Differs from female in having extreme costal edge blackish; the hindwings are distinctly black, with snow-white cilia. In some *female* specimens the hindwings are strongly suffused with blackish, and some specimens measure 54 mm. in expanse.

Thirty-two fine specimens, male and female, at a street lamp at Parkside in December. I have also seen specimens from Queensland and Sydney, so that it would appear to have a wide range.

Crypt. irrorata, *Lewin.*

Two fine male specimens from Reedbeds, from *Casuarina quadrivalvis.* Hitherto not known from South Australia.

Lichenaula, *Meyrick.*

Lich. selenophora, sp. nov.

Male and female, 25-28 mm. Head and thorax ashy-grey-whitish. Face white. Palpi whitish, irrorated with fuscous, terminal joint fuscous. Antennæ fuscous, base whitish, sharply annulated with white, ciliation one. Abdomen grey-whitish, abdominal segments lighter, anteriorly edged with reddish-ochreous bands. Legs whitish, anterior and middle tinged with dark fuscous. Forewings oblong, posteriorly dilated, costa gently arched, apex rounded, hindmargin straight, oblique; 7 to hindmargin immediately below apex; ashy-grey whitish, irrorated with black, the coalescence of which tends to form obscure markings, leaving costal edge snow-white, from near base to near apex; an irregular suffusion in disc; a streak from base angulated downwards towards inner margin, but not touching it, at one-fifth thence obscurely continued along fold to beyond middle; a moderate irregular suffused circle, anterior edge more pro-

nounced immediately above anal angle, enclosed space almost white; a whitish apical patch obscurely continued along hindmargin to anal angle; a suffused blackish hindmarginal line; cilia ashy-grey, basal-half darker. Hindwings distinctly sinuate beneath apex; grey-whitish, slightly ochreous-tinged, much lighter towards base; cilia whitish, base yellowish-tinged, with a fuscous parting-line near base.

Rather variable in markings and intensity of colouring, the costal streak and curious mark above anal angle are distinct characters. Nearest to *laniata*, Meyr. Eighteen specimens beaten from *Banksia marginata*, at Blackwood, in November.

Xylorycta, *Meyrick.*

Xyl. leucophanes, sp. nov.

Male and female, 24-30 mm. Head, thorax, and abdomen shining white. Abdominal segments obscurely reddish, anal tuft whiter Palpi above white, second joint beneath fuscous, except towards base. Antennæ fuscous. Anterior and middle legs black, beneath white; posterior tibiæ and tarsi pale-greyish-ochreous, slightly infuscated. Forewings oblong, hardly dilated costa gently arched on basal-half, thence straight, apex obtuse, hindmargin obliquely rounded; shining snow-white; costal edge blackish from base to near apex, posteriorly attenuated; cilia shining snow-white. Hindwings pale grey-whitish, darker towards apex; cilia shining snow-white, with a faint grey median line. Underside of wings smoky fuscous. Hindwings paler; cilia white.

Five specimens bred from *Hakea rugosa*, the larvæ form conspicuous galleries of rough mud-coloured silk and refuse, and the imago emerge at intervals during December and January. Nearest to *orectis*, Meyrick. My specimens were obtained at Highbury; a remarkable coincidence is, that all the specimens emerged on consecutive Sundays, generally at about 7 p.m.

Phylomictis, *Meyr.*

Phyl. monochroma, sp. nov.

Male, 25 mm. Head, antennæ, palpi, and thorax black, palpi internally whitish. Legs dark-fuscous, whitish beneath; posterior pair whitish. Abdomen reddish-fuscous, segments obscurely whitish. Forewings elongate, costa gently arched, apex round-pointed; hindmargin obliquely rounded; black, without markings; a large obscure blotch of whitish scales about middle of wings, nearer inner margin than costa: cilia dark fuscous sprinkled with darker. Hindwings grey; darker posteriorly; cilia grey, with an indistinct darker line.

One specimen at Parkside in March. Not to be confused with any other.

List of South Australian Species of Kangaroos and Wallabies.*

By A. Zietz, Assistant Mus. Director.

[Read March 1, 1892.]

Kangaroos.

Macropus giganteus, *var. typicus.*

Great Grey Kangaroo, Scrubber, &c.
All Australia, except the extreme north.

Macropus giganteus, *var. melanops.*

Black-faced Kangaroo. Apparently a dwarf *form* of the above. The two live side by side in the same district.
Eastern and South-Eastern Australia *(Oldfield Thomas)*; Ninety-mile Desert, Humbug Scrub (Public Mus.).

Macropus fuliginosus.

Tasmanian Great Kangaroo *(Oldfield Thomas).*
Kangaroo Island (Public Mus. S.A.).

Macropus robustus.

Wallaroo; Euro (syn., *erubescens). (Oldfield Thomas).*
Port Augusta and 400 miles north of Adelaide *(Oldfield Thomas;* Winnininnie *(*(Public Mus.).

Macropus rufus.

Great Red Kangaroo.
Eastern, South-Eastern, and South Australia *(Oldfield Thomas).*

Large Wallabies.

Macropus ruficollis *(var. typicus).*

Mount Gambier district (Public Mus.).

Macropus Greyi.

Grey's Wallaby; Toolatsche; Brush-tailed Kangaroo, &c.
South-East of South Australia.

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* The names adopted from the British Museum Catalogue of the Marsupialia by Oldfield Thomas; London, 1888.

Small Wallabies.

MACROPUS EUGENII.

Dama or Kangaroo Island Wallaby.
Still numerous on Kangaroo Island.

PETROGALE XANTHOPUS.

Yellow-footed Rock Wallaby.
South Australia (rocky districts).

Further Notes on Australian Coleoptera, with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

[Read May 3, 1892.]

XI.

The species described in the following pages are a somewhat miscellaneous aggregate, some of them having been collected by myself, and others having come into my hands for description from various sources. Among the most interesting are a number of *Coccinellidæ*, collected by Mr. A. Koebele, agent of the United States Department of Agriculture, during a tour which that gentleman has been making with a view of investigating the depredations of that family on scales and other enemies of plant-life. Mr. Koebele has placed in my hands for determination the species that he has collected, among which are a considerable number of novelties, as will be seen on reference to the following pages.

CARABIDÆ.

TACHYS.

I hesitate a little in referring the following species to this genus on account of the sutural stria not being recurved, but it presents all the other distinctive features of *Tachys*, and is so extremely like some species (*e.g.*, *T. Flindersi*, Blackb.) that have the recurved stria that I hardly think it can rightly be regarded as a new generic form on that character alone.

T. Yarrensis, sp. nov. Modice elongatus; minus convexus; nitidus; ferrugineus, capite infuscato; antennis sat elongatis, submoniliformibus; prothorace transverso, canaliculato, postice minus angustato, lateribus antice sat fortiter rotundatis postice vix sinuatis, angulis posticis rectis; elytris substriatis, striis sat fortiter punctulatis, sculptura nec apicem nec latera versus obsoleta; stria recurva nulla. Long., 1 l. (vix); lat., $\frac{3}{10}$ l.

At once distinguishable from its allies by the elytral sculpture not becoming obsolete towards the sides and apex, and by the absence of a recurved stria.

Victoria; Upper Yarra; sent by C. French, Esq.

STAPHYLINIDÆ.

QUEDIUS.

Q. pictipennis, sp. nov. Sat robustus; sat nitidus; niger, subiridescens, elytris externe rufo-marginatis et utrinque vitta obliqua rufa ab humero ad angulum suturalem producta ornatis, antennis piceis basi rufis, pedibus piceis; capite transverso, punctura magna utrinque in oculi margine et 3 aliis postice instructo, oculis magnis; prothorace vix transverso, antrorsum a basi sat fortiter angustato, antice truncato, angulis posticis cum basi omnino rotundatis; elytris quam prothorax vix longioribus sat crebre minus fortiter punctulatis; abdomine in medio antice vix manifeste, postice et ad latera sparsim fortiter punctulato. Long., 3 l.

The punctures on the prothorax are on either side as follows: —two close to the front margin, one in the lateral margin behind the middle, several on the base, one on the front part of the disc near the middle, and three arranged in a triangle also on the disc, but nearer to the lateral margin and the base. The antennæ are moderately elongate, joint 1 the longest, 2 and 3 about equal in length (longer than the following joints), 7-10 gently transverse. In size and build resembles *Q. ruficollis*, Grav., but quite differently coloured, with the elytra much more closely punctulate, the prothorax and abdomen very differently punctured, &c.

Victoria; Dandenong Ranges; given to me by C. French, Esq.

HYPEROMMA.

The recent acquisition from Mr. French of an example (taken in the Dandenong Ranges, Victoria) referable to this genus has enabled me to ascertain somewhat certainly that the examples referred to by me in Tr. Roy. Soc., S.A., 1891, p. 70, as possibly *H. lacertinum*, Fvl. are not that species. The specimen recently acquired is very distinct from those mentioned in my former paper, and agrees with the characters of *H. lacertinum* much more satisfactorily than they do. Indeed I am not sure that the latter ought not to be regarded as forming a new generic type on account of their eyes very distinctly smaller and less entirely situated on the upper surface of the head (they are, however, much more so than in *Scimbalium*, *Lathrobium*, &c.), and the anterior tarsi of the male quite strongly dilated; the prothorax too is much less strongly narrowed hindward. As however the eyes are distinctly nearer in position to those of *Hyperomma* than of *Scimbalium*, the elytra very small and narrow, and the insect apterous, I do not see any objection to leaving this species in *Hyperomma* with the remark that it has much the facies (and tends towards the characters) of *Scimbalium*. I characterize it below.

H. abnorme, sp. nov. Apterum; angustum; nitidum; convexum; antice parce pilosum, abdomine densius pubescenti ; piceum, capite rufescenti ; capite quam latiori distincte longiori, postice sparsim subfortiter punctulato et antice posticeque foveis sat magnis nonnullis impresso ; prothorace quam caput parum longiori haud latiori, quam latiori duabus partibus longiori, postice leviter angustato, sparsim subtilissime (latera versus magis fortiter) punctulato, puncturarum majorum seriebus 4 (medianis singulis puncturis circiter 13 compositis) paullo confusis impresso, punctura sat magna utrinque inter seriem medianam et lateralem posita ; elytris quam prothorax multo brevioribus paullo angustioribus, fortiter rugulose punctulatis et puncturis majoribus indistincte 3-seriatim impressis, latera versus obscure concavis.

Maris capite confuse longitudinaliter striato ; tarsis anticis fortiter dilatatis ; segmento ventrali apicali profunde angulatim anguste inciso, penultimo in medio profunde subrotundatim foveato ; supra abdominis segmentis 2-4 in medio longitudinaliter leviter canaliculatis.

Feminæ capite angustiori haud striato ; tarsis anticis vix dilatatis ; segmento ventrali apicali postice sat angustato fere ut maris inciso, penultimo simplici ; supra segmentis haud canaliculatis. Long., $5\frac{1}{5}$ l.; lat., $\frac{4}{5}$ l.

Victoria ; Alpine district.

SCOPÆUS.

S. femoralis, sp. nov. Minus nitidus ; minus depressus ; pube sat subtili vestitus ; rufo-ferrugineus, capite antennarum articulis intermediis abdomineque leviter infuscatis ; crebre subtiliter minus distincte punctulatus ; capite subelongato, sat quadrato, prothorace vix latiori ; hoc minus elongato, basi manifeste biimpresso, supra linea mediana obsoleta sat nitida instructo ; elytris prothorace vix latioribus, distincte brevioribus, femoribus anticis ad apicem dente antrorsum directo, et subtus in medio dente magno, armatis ; tibiis anticis basi summa subito angustatis. Long., $1\frac{3}{5}$ l.; lat., $\frac{3}{10}$ l. (vix).

The uniformly-coloured rufous prothorax and elytra with clear testaceous-red legs and darker head and abdomen will at once separate this species from its previously described Australian congeners. It is also distinct by its less quadrate head, and its prothorax less narrow in proportion to the head and elytra (which cause it to appear not quite so slender a species), also by the elytra distinctly shorter (in proportion to the prothorax, and also in proportion to their own width) than in any of the species I

have previously described. M. Fauvel's two species are very differently coloured, and no doubt differ in other respects, but the proportions of the segments, *inter se*, are not precisely stated.

The shape of the anterior femora is peculiar, and would probably justify generic separation; it is not sexual. The outline of the under surface is emarginate on the apical half and is angular at the inner limit of the emargination; the apex of the femur projects forward in a little spine or tooth.

N.S. Wales; Blue Mountains.

S. latebricola, Blackb.

S. dubius, Blackb.

S. obscuripennis, Blackb.

The front legs of the above three species are shaped as in *S. femoralis*. I regret that this character escaped my notice at the time I described them.

AMPHICROUM.

A. Adelaidæ, sp. nov. Rufo-testaceum, elytris dilutioribus (nonnullis exemplis plus minusve, præsertim juxta scutellum maculatim infuscatis), nonnullis exemplis abdomine plus minusve infuscato; antennis modice elongatis, articulo 4° quam 3^{us} breviori 5° æquali, 6-11 multo latioribus, 7-10 modice transversis, 11° quam 10^{us} longiori; capite utrinque vix manifeste impresso, crebre æqualiter sat fortiter punctulato; prothorace quam longiori fere duplo latiori, antice sat angustato, fere ut caput (sed minus crebre) punctulato, lateribus modice arcuatis, angulis posticis obtusis explanato-elevatis; elytris quam prothorax circiter duplo longioribus, vix aliter punctulatis, apice truncatis angulis externis rotundatis; abdomine crebre subtiliter punctulato; tibiis haud spinosis.

Maris (?) abdomine sat lato retrorsum gradatim angustato, segmento ventrali penultimo quam antepenultimus fere duplo longiori, apicali conico ad apicem anguste truncato.

Femina (?) abdomine magis parallelo, segmento ventrali penultimo quam antepenultimus sat longiori, apicali profunde inciso, parte interna protrusa subspiniformi subtus longitudinaliter canaliculata. Long., 1$\frac{3}{5}$—2 l.; lat., $\frac{3}{5}$ l.

Differs from *A. australe*, Fvl., *inter alia* by its evenly punctured head, from *A. spinipes* by its non-spinose tibiæ, from *A. cribriceps*, Fvl., by its longer antennæ, the ante-penultimate joints of which are less transverse.

S. Australia; near Adelaide, &c.; on flowers.

A. cribriceps, Fvl. I have a short series (all males) of a species taken on flowers in the Blue Mountains, N.S.W., which agrees very well with M. Fauvel's description of this insect except in

respect of size. My examples are very small (Long., 1—1$\frac{3}{5}$ l.). The size of *A. cribriceps* is given as long. 4 mm. (=2 l., I suppose). On the other hand M. Fauvel says that *A. cribriceps* is much smaller than *A. australe* (the size of which is given as "Long. 4-5 mm.") which would hardly be a correct expression if an ordinary example of *cribriceps* were as large as a small one of *australe* (as is the case according to the published measurements).

ELEUSIS.

E. parva, sp. nov. Nitidissima; valde depressa; præter puncturas nonnullas setiferas fere lævis; pallide rufotestacea, antennarum (nonnullis exemplis) articulis intermediis et elytrorum disco (parte basali excepta) epipleurisque infuscatis; antennis sat gracilibus, articulo 3° quam ceteri angustiori, 4° 5° que piriformibus, 6-10 submoniliformibus ex ordine magis transversis, 11° quam præcedentes 2 vix breviori; capite plano fere æquali; prothorace antice fere capiti latitudine æquali, transverso, postice angustato, denticulo ante medium fere obsoleto seta nigra sat valida instructo; elytris quam prothorax paullo latioribus et manifeste longioribus. Long., 1 l.

New South Wales. Under bark of Eucalyptus on the Blue Mountains.

PAUSSIDÆ.

ARTHROPTERUS.

A. foveipennis, sp. nov. Piceo-rufus; sat nitidus; vix pubescens; capite sat crebre sat fortiter punctulato, inter oculos depresso; antennis latissimis, articulis 2°, 3°, 4° que ex ordine paullo latioribus, ceteris 4° latitudine æqualibus quam longioribus plus quam quater latioribus, ultimo quam præcedentes 3 conjuncti haud multo minori ad apicem late rotundato; prothorace quam longiori fere dimidio latiori, fortiter vix crebre punctulato (puncturis umbilicatis), disco depresso, latitudine majori longe ante medium posita, lateribus antice leviter rotundatis, angulis posticis rotundato-obtusis vix explanatis; elytris quam prothorax paullo minus crebre minus fortiter punctulatis, utrinque mox ante angulos suturales apicales fovea magna impressis, ad apicem in medio angulato utrinque sinuato (fere ut ⌣⌣); pygidio sat crebre sat fortiter punctulato; tibiis valde dilatatis, anticarum apice profunde triangulariter exciso (angulo apicali externo acuto), posterioribus 4 ad angulum apicalem externum oblique truncatis. Long., 5$\frac{4}{5}$ l.; lat., 1$\frac{9}{10}$ l.

The dilatation of the antennæ and legs in this species is re-

markably strong; saving a fringe of rather close-set hairs running round the external margins, it is almost glabrous.

N. Territory of S. Australia; near Palmerston.

A. occidentalis, sp. nov. Pallide piceo-rufus; sat nitidus; vix pubescens; capite crebre sat fortiter punctulato inter oculos vix depresso; antennis valde dilatatis, articulis 2°, 3°, 4° que ex ordine paullo latioribus, ceteris 4° latitudine æqualibus quam longioribus circiter quater latioribus, ultimo præcedentibus 2 conjunctis sat æquali ad apicem late rotundato; prothorace quam longiori circiter quarta parte latiori, fortius sat crebre punctulato, late leviter canaliculato, latitudine majori longe ante medium posita, lateribus antice modice arcuatis postice vix sinuatis, angulis posticis rotundato-rectis vix explanatis; elytris crebre subtilius punctulatis, utrinque ad angulos suturales apicales fovea magna obscura obsolete impressis, apice late membranaceo postice obsolete tridentato; pygidio crebre subfortiter punctulato; tibiis sat fortiter dilatatis, anticarum apice triangulariter inciso (incisuræ angulis utrisque valde acutis), posterioribus 4 ad angulum apicalem externum breviter oblique truncatis. Long., 5 l.; lat., $1\frac{1}{5}$ l.

The pubescence is much like that of the preceding species, but the lateral fringes are less distinct. The membranaceous apex of the elytra is almost truncate, but when closely examined it is seen to be feebly prominent in an angular fashion at the middle and on either side.

Western Australia; Yilgarn.

SILPHIDÆ.

COLON.

C. Melbournense, sp. nov. Ovale; sat nitidum; fulvo-pubescens; piceum, elytris basin versus rufescentibus, antennis basi apiceque et pedibus testaceis; prothorace transverso distincte punctulato, angulis posticis obtusis; elytris ut prothorax punctulatis, stria suturali distincta; femoribus posticis (maris) late distincte dentatis. Long., 1 l.

The antennæ are about as long as the prothorax, joints 7-10 infuscate, the rest testaceous; joints 1-3 about equal in length, 1 and 2 stouter than 3, 4 shorter than 3, not quite so wide as long obconic, 5 slightly wider, not longer than wide; 6 strongly transverse, 7 very strongly transverse (about three times as wide as long), scarcely so long as 6; 8-10 not differing much *inter se* (evidently wider than and about twice as long as 7), 11 conic, evidently longer than 10. The mesosternum is strongly carinate.

Compared with the European *C. brunneum*, Latr., this species is more oval and less closely punctulate.

Victoria; near Melbourne.

HISTERIDÆ.

PAROMALUS.

P. Ludovici, sp. nov. Ovalis; modice convexus; sat nitidus; piceo-brunneus, antennis pedibusque testaceis; capite sat plano sat crebre minus fortiter punctulato, stria frontali haud antice continuata; prothorace transverso, fere ut caput punctulato, antrorsum a basi arcuatim angustato, angulis posticis rectis, stria marginali antica integra; elytris quam prothorax magis fortiter paullominus crebre punctulatis, striis nullis nisi 2 lateralibus subobsoletis; propygidio subtilissime punctulato; pygidio (feminæ?) subgibbo sulcis obliquis 2 postice conjunctis instructo; prosterno bistriato; stria mesosternali biangulata; tibiis anticis fortiter dilatatis, denticulis valde minutis 6 extus armatis. Long., $\frac{3}{4}$ l.; lat., $\frac{2}{5}$ l.

The denticulations of the front tibiæ are so minute as to be scarcely distinct without the use of a compound miscroscope; four of them are larger than the other two. I do not think this species is very close to any previously described; it is probably nearest to *P. miliaris*, Mars., from Western Australia.

New South Wales; Blue Mountains.

PHALACRIDÆ.

LITOCHRUS.

L. Sydneyensis, sp. nov. Obovatus; nitidus; piceo-niger, antennis palpis pedibusque testaceis; capite prothoraceque vix perspicue punctulatis; elytris vix striatis, striis antice vix manifeste postice gradatim magis perspicue punctulatis, interstitiis fere lævibus. Long., 1 l. (vix); lat., $\frac{3}{5}$ l.

Differs from *L. alternans*, Blackb., *inter alia* by the absence of conspicuous punctures in the alternate interstices of the elytra; from *L. frigidus*, Blackb., by its entirely testaceous antennæ; from *L. lateralis*, Blackb., and *suturellus*, Blackb., by the almost entire absence of sculpture on the front half of the elytra; from *brunneus*, Er. (judging by the description of that species), by its darker colour and smaller size; and from its other previously described congeners by the want of a pattern on the elytra. It is a typical *Litochrus*, and therefore differs structurally in the tarsi from the species which I have attributed doubtfully to this genus.

New South Wales; on flowers near Sydney.

NITIDULIDÆ.

NOTOBRACHYPTERUS (gen. nov.).

Brachyptero affinis sed prosterno in processu distincto pone coxas anticas producto.

I do not find any other difference from the genus *Brachypterus* in the species for which I propose this new name; they have (as in *Brachypterus*) two segments of the abdomen uncovered, bilobed maxillæ (I have been able to spare for dissection only one of the species described below, but it is reasonable to suppose the maxillæ of the others similar), head devoid of antennal sulci, basal joints of tarsi dilated. The species described below have altogether the facies of *Brachypterus*. I have not seen a true *Brachypterus* (with prosternum not produced behind the front coxæ) taken in Australia; but two species have been attributed to the genus:—*B. metallicus*, Reitter, from "Australia," and *testaceus*, Bohem., from "Sydney." The former of these I have certainly not seen; the latter is approached by an example in my collection from W. Australia, which, however, has the prosternum produced hindward, and therefore is not a true *Brachypterus*, but as it is quite possible that this character may have escaped the notice of M. Bohemann, and I am unable to specify any other well-defined distinction in the example before me, I regard it as possibly *N. testaceus*, and refrain from describing it, although I have little doubt that a comparison of types would show them to be two species.

N. australis, sp. nov. Ovalis [femina (?) latiori]; vix perspicue pubescens; supra brunneus, corpore subtus antennis pedibusque testaceis; capite antice transversim impresso prothoraceque parum subtiliter vix crebre punctulatis; hoc ad basin quam elytrorum basis paullo latiori, fortiter transverso, antice sat angustato angulis posticis rotundatis; elytris fere ut prothorax punctulatis. Long., $1\frac{1}{5}$ l.; lat., $\frac{7}{10}$ l.

Compared with *B. gravidus*, Ill., which it equals in size, this species is somewhat wider and more robust and less pubescent and differently colored; it also differs *inter alia* in the following characters; the punctures on the head and prothorax are distinctly larger and not so closely crowded together, those of the elytra are less deeply impressed as well as larger and less close, the propygidium is coarsely coriaceous rather than distinctly punctulate.

W. Australia; taken by E. Meyrick, Esq.

N. creber, sp. nov. Ovalis; subtiliter pubescens; piceo-niger, ore antennis pedibus elytrorum segmentorumque dorsalium apice et segmentis ventralibus apicalibus totis rufescentibus vel testaceis; capite prothoraceque crebre minus subtiliter punctulatis, hoc ad basin quam elytrorum basis paullo latiori, sat transverso, antice sat angustato, angulis posticis rotundatis; elytris crebre squamoso-punctulatis vel potius coriaceis; propygidio postice in medio angulato. Long., 1 l.; lat., $\frac{1}{2}$ l.

This species seems distinct from the others of the genus and from *B. testaceus* and *metallicus* by its nearly black colour (which seems constant, as I have seen 7 or 8 examples). It is also distinct by the sculpture of its elytra which are coriaceous rather than definedly punctulate, although from a certain point of view fine punctures can be seen mixed with a network of fine wrinkles; the sculpture is altogether finer and feebler than on the elytra of the European species of *Brachypterus* known to me (e.g., *gravidus*, *pubescens*, *urticæ*). The shape of the hind margin of the propygidium, strongly bisinuate with the middle produced in a sharp angle (in one sex at any rate), also seems characteristic.

S. Australia; Port Lincoln district.

N. bifoveatus, sp. nov. Ovalis; vix perspicue pubescens; testaceus elytris indeterminate infuscatis; capite antice foveis 2 transversim positis impresso prothoraceque distincte subfortiter sat crebre punctulatis; hoc fortiter transverso, antice minus angustato, angulis posticis rotundatis; elytris subtilius subsquamose vix crebre punctulatis. Long., 1 l.; lat., $\frac{1}{2}$ l. (vix).

This little species is distinguishable by the two well-defined and distinct round foveæ placed transversely on the line dividing the clypeus from the hinder part of the head. From the species which I take to be possibly *Brachypterus testaceus*, Bohem., and from *N. creber* it also differs by the much more distinct and less crowded puncturation of its head and prothorax. It is very near *N. australis*, Blackb., but differs by its smaller and narrower form, its different colour, the foveæ on its head (which in *N. australis* are replaced by a short transverse sulcus), the considerably more sparse puncturation of its head, and the evidently more quadrate form of its prothorax.

S. Australia; near Adelaide.

N. nitidiusculus, sp. nov. Ovalis; tenuiter pubescens; niger; antennis palpis pedibusque rufo-testaceis; capite sat æquali, sat crebre minus profunde nec subtiliter punctulato (certo adespectu subconcentrice rugato); prothorace fere ut caput punctulato et (certo adspectu) confuse rugato, fortiter transverso, antice sat angustato, angulis posticis rotundatis; elytris sat crebre minus profunde nec subtiliter subsquamose punctulatis. Long., 1 l.; lat., $\frac{1}{2}$ l. (vix).

Var. minor, supra brunnescens.

A very nitid little species resembling *N. creber* in colouring, but differing from that species *inter alia* in its much feebler but less fine puncturation. From the other species described above it differs by the even surface of its head. From the insect mentioned above as possibly *B. testaceus*, Boh., it differs *inter alia*

by the very much less close puncturation of its head, and from *B. metallicus*, Reitt., by the total absence of any metallic tone of colouring.

W. Australia; taken by E. Meyrick, Esq.

N. lilliputanus, sp. nov. Ovalis; tenuiter pubescens; brunneus, antennis palpis pedibusque dilutioribus; capite æquali subtiliter minus crebre punctulato; prothorace sat transverso, antice minus angustato, subtilissime sat sparsim punctulato, angulis posticis rotundatis; elytris subtiliter magis crebre subaspere punctulatis. Long., $\frac{7}{10}$ l.; lat., $\frac{2}{5}$ l. (vix).

Its extremely small size will distinguish this species from its allies. The even surface of its head associates it with *nitidiusculus*, *creber*, and the species I have called *testaceus?*, all of which are very differently punctured.

S. Australia; I am doubtful of the exact habitat, but believe it to be near Adelaide.

IDÆTHINA.

I. cincta, Blackb. I have recently received from M. Grouvelle an example of *I. Deyrollei*, Reitt., which M. Grouvelle informs me has been compared with the type. In describing *I. cincta* (Tr. R. Soc. S.A., 1891, p. 107) I expressed some slight doubt as to its generic identity with the typical species, which, however, M. Grouvelle's favour has proved to have no foundation. In fact, *I. cincta* is nearer to *Deyrollei* (even specifically) than I had supposed. Compared with the example of the latter (from N.S. Wales) which, M. Grouvelle has sent, its elytra are distinctly striated throughout, whereas, at any rate near the suture, there are no striæ in the N.S. Wales specimen. In *I. cincta* moreover the underside is much more closely punctulate; this is especially noticeable on the middle part of the metasternum which, in the example from M. Grouvelle, is very nitid and bears only very sparse and fine puncturation.

COLYDIIDÆ.

TRISTARIA.

I do not think there can be any doubt that the species described below should be referred to this genus, which has very strongly marked characters; the tetramerous tarsi, 2-articulate antennal club, very widely separated coxæ, and elongate basal ventral segment of *Bothrideres*, in combination with considerable elongation of the palpi and antennæ, partial exposure of the pygidium, slenderness of tibiæ, &c. The species described below agrees very well with the diagnosis of this genus in respect of all the above-named characters, but it has not "simple mandibles,"

those organs being truncate at the apex, and having a short sharp piece projecting from the external angle of the truncation; nor does the labrum quite agree with the diagnosis which merely characterises it as "broad, rounded externally," whereas in the species before me it is narrowed from base to apex, with the sides little or not rounded, the surface set with numerous long fulvous hairs, and the apex deeply impressed above so as to give an emarginate appearance. These discrepancies do not seem sufficient to justify the creation of a new genus.

T. labralis, sp. nov. Oblonga; sub parallela; sub depressa; corpore subtus (meso- et meta-sternis nigris exceptis) antennis pedibusque obscure rufis nitidis, corpore supra subopaco pilis brevissimis fulvis sat dense vestito, lateribus breviter confertim fimbriatis; capite prothoraceque nigris crebre subtilius profunde punctulatis; hoc transversim quadrato utrinque in disco vix manifeste impresso, linea media vix notata, lateribus fere rectis, angulis sat rectis; elytris rufo-brunneis confertim subtiliter punctulatis, sculptura apicem versus vix obsoletescenti; corpore subtus subtilissime sparsissime, sternis ad latera multo magis fortiter subrugulose, punctulatis. Long., $1\frac{4}{5}$—$2\frac{1}{2}$ l.; lat., $\frac{1}{2}$—$\frac{7}{10}$ l.

The elytra are (very noticeably) still more closely and finely punctured than the prothorax; on the latter the punctures in some lights seem to run into fine wavy wrinkles placed more or less longitudinally. Apart from the structural characters mentioned above, this species seems to differ from the two previously described by its elytral sculpture scarcely if at all growing feebler near the apex, also by its colour.

Victoria; near Cheltenham; sent by C. French, Esq.

CUCUJIDÆ.

LÆMOPHLŒUS.

L. Australasiæ, sp. nov. Sat elongatus, postice nonnihil angustatus; depressus; nitidus; glaber; testaceus, elytris ante apicem fascia lata infuscata ornatis; fronte sat convexa, linea longitudinali mediana impressa; capite prothoraceque sparsim minus subtiliter punctulatis; hoc sat transverso, postice leviter angustato, utrinque unistriato, striis pone medium fovea profunda elongata impressis, lateribus vix arcuatis, angulis anticis dentiformibus, posticis obtusis; scutello transverso; elytris punctulato-striatis in disco utrinque longitudinaliter concavis, ad apicem conjunctim rotundatis.

Maris antennis quam corpus vix (feminæ tertia parte) brevioribus. Long., 1 l.; lat., $\frac{3}{10}$ l.

The deep and elongate fovea into which the prothoracic striæ are dilated immediately behind the middle will distinguish this species, I think, from all its described Australian congeners. The wide blackish fascia occupying nearly all the apical half of the elytra furnishes another conspicuous character.

Victoria; taken by Mr French in the Dandenong Ranges.

CRYPTAMORPHA.

C. Macleayi, sp. nov. Minus elongata; sparsim longe pubescens; obscure brunneo-testacea, elyris circa scutellum et transversim pone medium plus minusve distincte infuscatis; capite sat opaco sparsim sat fortiter (nullo modo rugulose) punctulato, sulcis frontalibus subtilibus a lateribus longe remotis; prothorace leviter transverso crebre fere rugulose punctulato, lateribus subrotundatis vix crenulatis; elytris sat fortiter punctulato-striatis, interstitiis subtiliter seriatim punctulatis. Long., $1\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

The most striking characters of this species appear to be the opacity of its head, the extreme fineness of the frontal sulci (especially the inner one), and the unusual width of the space that separates the inner sulci from the eye. I have named it after the late Hon. Sir W. Macleay.

N. S. Wales; Blue Mountains; not rare among dead leaves of *Eucalyptus*.

MYRABOLIA.

M. Lindensis, sp. nov. Testacea; subnitida; oblonga; subtiliter fulvo-pubescens; vix depressa; capite prothoraceque crebre subtilissime punctulatis; hoc subquadrato, leviter transverso, subtiliter reflexo-marginato, æqualiter leviter convexo, lateribus subparallelis, angulis posticis subacutis; elytris subtiliter punctulato-striatis, interstitiis subtilissime punctulatis et (præcipue marginem versus) subtiliter carinatis; corpore subtus confertim subtiliter punctulato. Long., $1\frac{1}{10}$ l.; lat., $\frac{2}{5}$ l. (vix).

The prothorax resembles in outline that of *M. Haroldiana*, Reitt., but is a little narrower, and has the hind angles quite sharply defined; it is considerably more finely punctured, and has no trace of an impression near the front. It differs also from *M. Grouvelliana*, Reitt. (of which M. Grouvelle has very kindly given me a type), by the much straighter sides of its prothorax, the much sharper hind angles and finer puncturation of the same and the closer puncturation of its metasternum.

The very fine slightly raised lines running down the elytra are not peculiar to this species, as I find them distinctly traceable its two described congeners.

S. Australia; under bark of *Eucalyptus* near Port Lincoln.

M. parva, sp. nov. Ferruginea; subnitida; oblonga; subtiliter fulvo-pubescens; vix depressa; capite prothoraceque subtiliter vix crebre punctulatis; hoc subquadrato sat transverso, subtiliter reflexo-marginato æqualiter leviter convexo, lateribus subparallelis, angulis posticis subacutis; elytris subtiliter punctulato-striatis, interstitiis subtilissime punctulatis et (præcipue marginem versus) subtiliter carinatis; corpore subtus confertim subtiliter punctulato. Long., $1\frac{1}{10}$ l.; lat., $\frac{2}{5}$ l. (vix).

The prothorax, in outline, resembles that of *M. Haroldiana*, Reitt., but has the hind angles distinctly sharper; it is devoid of the discal depression, and its puncturation is evidently less close. The shape of the prothorax distinguishes this species from *M. Grouvelliana*. From *M. Lindensis* it differs by its prothorax, evidently more transverse and (together with the head) considerably more strongly punctulate.

N. S. Wales; near Sydney.

M. Haroldiana, Reitt. The habitat of this species is given as "Australia;" I have taken an insect which agrees well with the description in various localities in S. Australia; under bark of *Eucalyptus*.

CRYPTOPHAGIDÆ.

CRYPTOPHAGUS.

C. gibbipennis, sp. nov. Sat elongatus, postice angustatus; minus convexus; ferrugineus, elytris circa scutellum et in apice infuscatis; pube fulva minus crebre vestitus; prothorace vix transverso, subfortiter sat sparsim punctulato, ante scutellum gibbo, lateribus fere rectis leviter sinuatis, angulis omnibus acutis; elytris juxta scutellum utrinque gibbis, ut prothorax punctulatis; tarsorum articulo primo sat brevi; abdomine plus minusve infuscato. Long., 1 l lat., $\frac{2}{5}$ l. (vix).

A ferruginous red species with the region of the scutellum and the apices of the elytra infuscate, or almost black. The gibbosity on the base of the prothorax seems to be outlined (except on the actual base, which it touches) by a feeble sulcus; the two gibbosities (placed one on either side of the scutellum) on the elytra are more conspicuous than that on the base of the prothorax. The antennæ laid back slightly surpass the base of the prothorax; their joints 3–8 are of about equal thickness and length (except that 3 is slightly longer than the others), 1 and 2 are much thicker but scarcely longer than 3, 9 and 10 strongly transverse and scarcely different *inter se*, 11 a little longer and scarcely transverse.

This species is certainly near *Cryptophagus*, with which it agrees in its males being heteromerous, while the females are pentamerous. Its comparatively parallel and depressed form, and the nearly straight sides of the prothorax, which are quite devoid of inequalities, give it a somewhat different facies, but I do not find any satisfactory character on which to found a new genus for it.

Victoria; Dandenong Ranges (Mr. French); also Tasmania.

ATOMARIA.

A. eucalypti, sp. nov. Sat late ovalis; sat nitida; sat convexa; sparsim pubescens; ferruginea, antennarum clava et elytris (basi apiceque exceptis) obscurioribus; capite prothoraceque sat crebre subrugulose, elytris sparsim subtiliter, punctulatis; prothorace sat æquali, fortiter transverso, antice in medio late sat fortiter producto, ad basin marginato, antice quam postice paullo augustiori, angulis posticis acutis retrorsum directis; capite antice subelongato; antennis basi distantibus. Long., $1\frac{1}{4}$ l.; lat., $\frac{3}{5}$ l.

Possessing only a female of this species, I am unable to say positively that the male has pentamerous tarsi, placing it in *Atomaria*, but its general characters and superficial appearance are so decidedly of that genus that I have no hesitation in placing it there provisionally. The head rather strongly produced in front of the antennæ may perhaps suggest the want of a new generic name, but as the description of the Australian *Cryptophagidæ* has hardly been touched, it would be a mistake to form new genera at present on any but very strong characters. In my opinion it is always wiser for the describer of species to attribute to an existing genus any species that is not so distinct from the typical form as to render it probable that other workers would fail to look for it there, leaving generic questions as much as possible to those who make them a speciality, and as the present insect is so like an *Atomaria* superficially and structurally that no careful worker, having it before him, could fail to regard the probability of its having been attributed to that genus, my principle leads me to place it there instead of forming a new genus on slight characters.

The darkest part of the infuscation of this insect is on the elytra, where it is quite of a pitchy tone, and is fairly distinctly limited, taking the form of a very wide fascia, leaving about the basal and apical quarters of the elytra of the rufous ground-colour. The antennæ are very widely separated, and their club is unusually strong and abrupt; they are, in fact, suggestive of *Cryptophagus*, but the general appearance and the simple margins of the prothorax are out of harmony with that genus.

N. S. Wales; Blue Mountains; under bark of *Eucalyptus*.

DERMESTIDÆ.

TROGODERMA.

T. Froggatti, sp. nov. Elongato-ovale; nigro- et rufo-hirtum; nigrum, antennarum stipite rufo, elytris ante medium fascia rufa (suturam haud attingenti) ornatis, lateribus apiceque rufis; subtilius sat sparsim punctulatum, sulcis antennariis latis minus profundis triangularibus, postice leviter clausis.

Feminæ (?) antennarum clava ovali 5-articulata (quam articuli 1-6 conjuncti multo longiori), hujus articulis 1-3 ex ordine latioribus, 4° quam 3us paullo angustiori, ultimo quam præcedentes 2 vix breviori. Long., $1\frac{3}{5}$ l.; lat., $\frac{4}{5}$ l.

A very distinct species on account of the markings on its elytra; its prosternal sulci, while very distinct from the narrow sharply cut furrows of *T. Lindense*, Blackb., and its allies, are deeper than in the species which I have tabulated (Tr. Roy. Soc. S. A., 1891, p. 129) as having feeble prosternal sulci. In the tabulation in question this species would fall beside *T. Meyricki*, from which it differs *inter alia* by the markings on the elytra, and perhaps in the number of joints composing the antennal club in the male. I do not feel sure of the sex of the two specimens before me. The markings on the elytra are very like those of *Cryptorhopalum Australicum*, Blackb.

N. S. Wales; taken by Mr. Froggatt, near Yass.

T. singulare, Blackb. In my description of this species (Trans. Roy. Soc. S. A., 1891, p. 129, line 31) for "quam articulati, 1-4," read "quam articuli 1-4."

LAMELLICORNES.

ONTHOPHAGUS.

O. Geelongensis, sp. nov. Brevis; subnitidus; setis erectis vestitus; piceus (elytris dilutioribus) læte viridi-micans, colore viridi in clypeo corpore subtus tibiis tarsisque carente, antennis rufescentibus; clypeo confluenter ruguloso, capite postice prothorace et pygidio sat crebre sat fortiter punctulatis; elytris ad latera confuse fortiter sat crebre punctulatis puncturarum series 14 geminatim positas gerentibus, interstitiis vix convexis sat lævibus; tibiis anticis extus 4-dentatis.

Maris (?) capite transversim 2-carinato, carina antica in medio tuberculiformi. Long., $2\frac{1}{5}$ l.; lat., $1\frac{2}{5}$ l.

The interstices of the striæ on the elytra would be lævigate were it not for the rows of punctures being a little irregular, so that here and there one of their punctures is impressed out of line, and on an interstice. The rows of punctures are arranged

in pairs, the two of each pair separated by a very fine stria, a rather wide interstice between each pair and the next pair. I have little doubt that the example before me is a male, but it is not certain owing to the want of an example of the other sex. I have not seen any other *Onthophagus* coloured as this, the general surface piceous inclining towards testaceous on the elytra, the whole upper surface with a rich green gloss, more noticeable in some than in other lights.

Victoria; near Geelong; in the S. A. Museum.

APHODIUS.

A. Frenchi, sp. nov. Obovalis; sat convexus; niger vel piceus nonnullis exemplis plus minusve rufescentibus; nitidus; clypeo antice late leviter emarginato; prothorace sat æqualiter punctulato; elytris profunde crenato-striatis, interstitiis parum convexis sparsim subtiliter punctulatis. Long., $1\frac{3}{5}$—2 l.; lat., $\frac{7}{10}$—$\frac{4}{5}$ l.

This little species is very like the European *A. pusillus*, Sturm, differing little from it except in the more evident emargination of the front of the clypeus, the much closer puncturation of the prothorax (the punctures of which are of uniform size, and about as large as the larger punctures on the prothorax of *pusillus*, though becoming a little finer close to the front margin), and the somewhat smaller teeth of the front tibiæ, the uppermost tooth being, moreover, a little more widely separated from the middle one. It agrees with *A. pusillus* in the following characters:—Scutellum small, setæ of the hind tibiæ elongate, prothorax margined behind and with blunt hind angles, mesosternum finely carinate.

This species is very distinct from all hitherto described as Australian, nor can I identify it as introduced from any other country, although in so enormous and widely distributed a genus as *Aphodius* it is difficult to be certain on this point.

S. Australia and Victoria; common.

A. Lindensis, sp. nov. Minus elongatus; subopacus, coriaceus; lividus, capite prothoracisque disco piceis, elytris obscure piceo-umbratis; capite prothoraceque sparsim fortiter punctulatis; illo æquali, clypeo antice sat reflexo late leviter rotundato; prothorace sat transverso postice haud marginato, lateribus antice fortiter rotundatis postice fortiter sinuatis; elytris fortiter striatis, interstitiis plus minusve convexis (1°, 3°, 5° que quam cetera magis convexis); tibiis anticis extus sat fortiter 3-dentatis; mesosterno haud carinato. Long., $2\frac{4}{5}$ l.; lat., $1\frac{1}{4}$ l.

Seems to be near *A. Candezei*, Har., but that species is

described as being larger, with three tubercles on the head, and the basal margin of the prothorax entire.

The scutellum is moderately small (about the same size as in *A. Howitti*, Hope), and is concave and punctured in the basal part; the hind tibiæ are fringed with both long and short bristles; the prothoracic border extends along the base, on either side, very little within the hind angles, which are roundly obtuse; the legs are comparatively long and slender, the hind tibiæ only very moderately dilated at the apex, with their two transverse keels well marked (the lower one the stronger of the two); the elytra are roundly obtuse at the shoulders (much as in *A. Howitti*); the prothorax is nearly lævigate on a wide space down the middle. The markings on the elytra consist of longitudinal piceous blotches, and are scarcely marked in the type; probably they vary.

S. Australia; a single example from the Port Lincoln district.

N.B.—A very small example of *Aphodius* (long., 2 l.) in the S. A. Museum,—locality unknown,—scarcely differs from this species; it has a scarcely traceable indication of a tubercle on either side of the forehead, and may be the male.

ATÆNIUS.

A. mendax, sp. nov. Sat angustus; parallelus; nitidus, niger; vel nigro-fuscus, pedibus dilutioribus, clypei marginibus antennisque testaceis; clypeo rotundato-emarginato; capite sat crebre sat fortiter punctulato, prothorace æquali dupliciter (subtiliter et sat crasse) nec rugulose punctulato; elytris sulcatis, sulcis catenulato-punctulatis, interstitiis carinatis sparsim subtilissime punctulatis, humeris dentatis. Long., $1\frac{4}{5}$ l.; lat., $\frac{7}{10}$ l.

Near *A. australis*, Har., but differing in the much less close puncturation of the head and prothorax, in the absence from the latter of any trace of a median channel, and in the narrower sulci of the elytra.

Victoria; taken in Fern Gully by Mr. French.

A. torridus, sp. nov. Angustus; parallelus; nitidus rufo-brunneus; clypeo rotundato-emarginato; capite in medio gibboso, antice vix perspicue postice et ad latera distincte sat crebre punctulato; prothorace æquali, dupliciter (subtiliter et subfortiter) nec rugulose punctulato; elytris sulcatis, sulcis catenulato-punctulatis; interstitiis vix perspicue punctulatis, humeris dente perparvo armatis. Long., $1\frac{1}{5}$ l.; lat., $\frac{1}{2}$ l. (vix).

A very small species not closely resembling any of its previously described Australian congeners. I have compared it

with the *Aphodiides*, from N. W. Australia, described by Sir W. Macleay, and find it quite distinct from them all.

N. Territory of S. Australia.

PROCTAMMODES (gen. nov.).

I propose this name as a substitute for *Proctophanes*, Har. (1861), the name *Proctophana* having been previously proposed by Lacordaire (1848) for a genus of *Clythrides*. I cannot find that this *double emploi* has been as yet corrected.

TROX.

T. Elderi, sp. nov. Latissimus; minus convexus; subnitidus; niger; capite crebre fortiter punctulato, haud tuberculato; prothorace quam longiori tribus partibus latiori, postice lobato, supra costis tuberculisque angustis inæquali (interstitiis planis in medio punctulatis latera versus granulatis), postice quam antice tribus partibus latiori, angulis posticis rectis, lateribus crenulatis; elytris confuse minus crebre granulatis et tuberculorum magnorum obtusorum seriebus 3 ornatis, lateribus leviter crenulatis; tibiis anticis extus 4- vel 5-dentatis, dente apicali plus minusve bifido. Long., 12 l.; lat., 8 l.

Differs from *T. Castelnaui*, Lansb., *inter alia* by the non-dentate lateral margins of its elytra; from *T. Dohrni*, Har., and *T. gigas*, Har., by its non-tuberculate head, &c.; from all three by its very wide and somewhat depressed form, and the numerous teeth on the margin of the front tibiæ; also differs from *T. Dohrni* and *Castelnaui* by the slenderness of the costæ and tubercles of its prothorax, which appear as linear elevations placed on a flat surface, and separated from each other by spaces at least two or three times as wide as each costa.

South Australia; taken by Professor Tate near Ooldea; also in the same region by Mr. Helms, of the Elder Exploration party.

T. gigas, Har. The commonest of the large species of *Trox*, which Dr. Sharp tells me is identical with the species labelled *T. gigas* in the British Museum, does not agree at all satisfactorily with the description of that species, from which it differs as follows:—The head is not bituberculate, but has a single transverse scarcely defined prominence at the base of the clypeus; the tubercles and costæ of the prothorax are not "angustuli," but are as wide as they can well be, there being no flat space at all between one and another of them; on the elytra the external (not the middle) row of tubercles is the shortest. In other respects this insect agrees with the description. I propose to call this form *T. Tatei* (? = *gigas*, var.).

I have seen a large number of examples of the large species of *Trox* (*Megalotrox*, de Borre) all from South-Western Australia; but have not yet met with an example agreeing with the description of *T. gigas*.

T. eremita, sp. nov. Oblongo-ovalis; minus nitidus; niger antennis (articulo primo excepto) rufis, capite (infra clypeum) rufo-hirto, tibiis capillis elongatis rufis fimbriatis; capite crebre rugulose punctulato distincte bituberculato, antice triangulari; prothorace quam longiori fere duplo latiori, postice quam antice plus quam dimidio latiori, postice lobato (lobo ante scutellum rotundato), fere ut caput punctulato, supra costis minus gracilibus inæquali, lateribus modice explanatis vix manifeste trisinuatis, ante angulos posticos subrectos manifeste emarginatis; elytris seriatim granulatis et tuberculorum minus elevatorum seriebus circiter 8 ornatis (harum serierum 2^{a}, 4^{a} que tuberculis quam ceterarum majoribus instructis, $5^{æ}$, $7^{æ}$ que tuberculis quam granuli adjacentes vix majoribus instructis); tibiis anticis externe tridentatis; processu prosternali modico, in medio acuminato. Long., 7—8 l.; lat., $4\frac{1}{3}$—$4\frac{1}{2}$ l.

Considerably like *T. Augustæ* in size and build, but with the elytra bearing rows of very distinct tubercles, many of which are fairly large, although only feebly protuberant; the tubercles near the base are more or less run together into a costiform appearance in the second and fourth series. I do not find any of the nitid spots on the elytra (distinct from the tubercles of the series) which are present in so many of the genus. Very distinct from *T. Augustæ* by the shape of the prosternal process also. The middle costæ of the prothorax are very much abbreviated behind. This species is probably near *T. dilaticollis*, Macl., in which, however, the prothorax is stated to be not at all narrower in front than at the base, and also perhaps near *T. Brucki*, Har., which, however, seems to be a much smaller species (long., $10\frac{1}{2}$ mm.), with the clypeus not angulated anteriorly.

Central Australia; MacDonnell Ranges.

T. quadridens, sp. nov. Oblongo-ovalis; sat opacus; niger, antennarum stipite rufo; capite infra clypeum obscure rufo-hirto, tibiis capillis elongatis rufis fimbriatis; capite obscure inæqualiter rugulose punctulato fortiter bituberculato antice vix angulato; prothorace quam longiori circiter dimidio latiori, postice lobato (lobo ante scutellum rotundato), postice quam antice circiter dimidio latiori, inæqualiter (hic confertim subtilius illic sparsius minus subtiliter) punctulato, supra costis sat robustis inæquali, lateribus fortiter trilobis, angulis posticis sat acutis; elytris undulatim sat

fortiter longitudinaliter granuloso-punctulatis et tuberculorum nitidorum seriebus circiter 10 instructis (serierum 3^m^, 5^m^, 7^m^, 9^m^ tuberculis quam ceterarum majoribus nec magnis, ceterarum quam granuli parum majoribus), latera versus plagulis nitidis planatis nonnullis ornatis; tibiis anticis externe quadridentatis, dente subapicali quam apicalis haud minore; processu prosternali fere truncato, in medio vix acuminato. Long., 6—6½ l.; lat., 4 l.

This species is remarkable for the very strong external teeth of its front tibiæ; the tooth next above the apex is quite as large as the apical one (which is bifid); the next above that is smaller but, nevertheless, quite a strong tooth (larger than that in most species of *Trox* which is next above the apical one); the uppermost is very small. The front tibiæ are thus very much as in the West Australian species, which I believe to be *T. stellatus*, Har., in which, however, *inter alia* the elytra are very differently sculptured.

South Australia; near Port Augusta.

T. Euclensis, sp. nov. Ovatus; opacus; niger, indumento griseo vestitus; capite fortiter minus crebre punctulato, tuberculis distinctis 2 instructo; prothorace quam longiori tertia parte latiori, antice quam postice tertia parte angustiori, postice trisinuatim lobato, ut caput punctulato, supra costis tuberculisque gracilibus inæquali (costa 2^a^ in medio interrupta, parte interrupta tuberculo nitido instructa), lateribus trisinuatim rotundatis, angulis posticis sat rectis; elytris subseriatim sat crebre granulatis et tuberculorum parvorum seriebus circiter 7 ornatis (tuberculis his hic illic plus minusve in costis brevibus conjunctis), plagulis nitidis hic illic sparsim dispersis; tibiis anticis externe trisinuatis vel obtuse tridentatis. Long., 5—7 l.; lat., 3⅘—4½ l.

This species is characterised by the following in combination; frontal tubercles very well defined, "second" prothoracic costa widely interrupted behind the middle, the centre of the gap being occupied by a small shining tubercle, "fifth" prothoracic costa represented by a small shining tubercle, all the prothoracic costæ very slender, sides of prothorax gently and somewhat trisinuately rounded, rows of tubercles on the elytra rather numerous, the alternate ones containing tubercles more or less larger than the intermediate ones (those of the second and fourth rows the largest); anterior tibiæ variable externally, in some examples somewhat obtusely tridentate, in others merely trisinuate. The prosternal process is sharply pointed behind.

S. Western Australia; Eucla, &c.

T. Augustæ, sp. nov. Oblongo-ovatus; minus nitidus; niger;

capillis rufis elongatis in capite pedibusque setis brevibus rufis in elytris vestitus; capite fortiter nec crebre punctulato, sat concavo, vix tuberculato, antice subtriangulari fortiter reflexo-marginato; prothorace quam longiori plus quam dimidio latiori, antice quam postice fere duplo angustiori, postice fortissime trisinuato-lobato (lobo ante scutellum angulato), leviter minus distincte punctulato, supra costis inæquali (mediis 4 bene determinatis, ceteris fere obsoletis), lateribus valde explanatis postice leviter arcuatis antice sinuatis, angulis posticis subrectis; elytris leviter costatis, vix tuberculatis, costis alternis paullo magis elevatis, interstitiis obscure transversim rugulosis et seriatim sat fortiter punctulatis (hic illic pustulis nitidis vix elevatis plus minus distincte ornatis); tibiis anticis externe bidentatis; processu prosternali sat fortiter spiniformi. Long., 7—8 l.; lat., 4—$4\frac{3}{4}$ l.

An extremely distinct species, notable for its elytra devoid of tubercles (the costæ being little more than crenulated even in the hinder part), its very strongly-lobed prothorax (a line joining the hind angles would pass very little behind the centre point of the segment), and the strongly-produced spiniform process of its prosternum.

S. Australia; near Port Augusta.

T. scaber, Linn. I have examples taken near Adelaide which I cannot separate from this European species; doubtless they are imported.

T. velutinus, sp. nov. Sat late ovalis; opacus; brunneo-niger, antennis testaceis, capite infra fulvo-hirsuto, corporis partibus elevatis (e.g., prothoracis et elytrorum tuberculis) rufescentibus; capite obscure ruguloso bituberculato antice vix angulato; prothorace quam longiori fere duplo latiori, postice lobato (lobo ante scutellum rotundato) postice quam antice minus quam dimidio latiori, haud punctulato, granulis ferrugineis adsperso (his latera versus confluentibus et costas fere tegentibus), supra in medio costas usitatas ferenti (costis intermediis integris), lateribus arcuatis vix sinuatis, angulis posticis obtusis; elytris seriatim punctulatis (puncturis sat magnis in fundo nitidis, in seriebus sat remote positis), interstitiis sat æqualiter tuberculis parvis elongatis opacis ornatis (his in seriebus sat crebre positis, in interstitiis 3°, 5° que ad basin costas formantibus); tibiis anticis in medio dente minuto extus armatis; processu prosternali perbrevi vix acuminato. Long., 5 l.; lat., $3\frac{1}{5}$ l.

A very peculiar-looking species, presenting a dark-brown velvety aspect with all the raised parts appearing as rusty red spots in a

certain light, and in a different light appearing almost of the colour of the derm. The front tibiæ too are peculiar, being scarcely dilated externally into a defined tooth even at the apex, and above the apex having only a very minute sharp tooth about the middle. The example before me has no trace of a removable indumentum.

N. Queensland ; sent to me by C. French, Esq.

BUPRESTIDÆ.

CYRIA.

C. tridens, sp. nov. Elongata; postice angustata; supra glabra, subtus pilis pallidis vix aliter quam *C. imperialis* vestita ; nigra, labro prothoracis vitta utrinque laterali antice posticeque abbreviata et elytris flavis, his nigro-notatis, pictura antice tridenti postice cultro simili ; capite subfortiter acervatim punctulato, longitudinaliter inter oculos antice carinato postice sulcato ; prothorace quam longiori (et postice quam antice) circiter dimidio latiori, foveis sat numerosis impresso, canaliculato, sparsim subtiliter (angulos anticos versus, nec ad latera, magis crebre) punctulato, lateribus a basi ad apicem sinuatim convergentibus, angulis posticis acutis sat productis ; elytris apice singulatim subspinoso-acuminatis, lævibus, puncturarum seriebus intra substantiam positis per superficiem conspicuis ; prosterno antice et ad latera sat fortiter rugulose punctulato retrorsum gradatim fere lævi ; metasterno ad latera sparsim sat fortiter punctulato, in medio fere lævi, abdomine ad latera sparsim subtiliter punctulato in medio lævi. Long., $11\frac{1}{2}$ l ; lat., $3\frac{1}{2}$ l.

The pattern on the elytra at once distinguishes this species ; it consists of a single common black mark, which (in the example before me) touches base, apex, or lateral margin only at the base of the suture. This black mark, in the hindmost third part of the elytra, is shaped like a ploughshare, from the middle of which (on the suture), rises a mark resembling a handle ; on this handle, and occupying more than the front half of the elytra, rests the anterior portion of the black mark, which resembles a trident, with the three prongs directed forward, the lateral prongs nearly (and the middle one quite) reaching the base of the elytra.

Compared with *C. imperialis*, Don., apart from colour and pattern, this species is, throughout, much more finely punctured. The prothorax is not more closely or coarsely punctured on the sides than on the disc; besides the round fovea at the base of the median line, there are two sharply defined foveæ on either side, placed longitudinally, about half-way between the median

line and the lateral margins, and two more on either side still nearer to the lateral margins ; the elytra (except at the extreme base) are absolutely devoid of sculpture ; the rows of what, on a casual glance, seem like punctures being on the underside, and only showing through. The elytra do not nearly meet at the sutural apex, but each elytron is separately narrowed behind into a subspiniform point.

NEOCURIS.

This genus seems to be very near *Anilara*, and both are near *Anthaxia*. They are both distinguished from the Australian genera allied to them by the total absence of longitudinal striæ on the elytra. M. Thomson says that *Anilara* appears to have only four segments in the hind body, but I think this must be a mistake ; at any rate, I have not seen any species in which I cannot trace a fine suture between the first and second segments, making the number five ; and I think I certainly know *A. Adelaidæ*, Hope. *N. Mastersi*, Macl., is described as having the elytra punctulate-striate, but I should say there is a doubt whether this is a true *Neocuris*. Probably all the Australian species attributed to *Anthaxia* are either *Neocuris* or *Anilara*. *Anilara* seems to be best distinguished from *Neocuris* by its short stout tarsi ; its prothorax also is more strongly rounded laterally (as M. Thomson points out), but this character does not seem equally reliable in all the species. M. Thomson says that the apical ventral segment in *Anilara* is excavated ; I do not find this to be quite an exact description of the structure, but its free margin has a distinct raised border running completely round it, which seems to be invariable, and undoubtedly gives it a certain appearance of being excavated ; this border being absent in *Neocuris*.

Neocuris as at present constituted may be characterised by its small scutellum and moderately slender and elongate tarsi in combination with absolutely non-striate elytra and apical ventral segment devoid of spines, and of a continuous raised border. I think the species presenting these characters will need further subdivision eventually, as some of them have the elytra much shorter than the hind body (a character not mentioned by M. Thomson), but it will perhaps be well for the present not to treat this character as generic. The following are new species :—

N. dilataticollis, sp. nov. Convexiuscula ; sparsim pubescens ; supra ænea, capite viridi, elytris antice latera versus viridi-micantibus, utrinque postice vitta submarginali læte purpurea, corpore subtus femoribusque viridibus, antennis tibiis tarsisque obscuris ; capite plano, crebre fortiter subrugulose punctulato ; prothorace fortiter transverso, ut caput

punctulato (latera versus paullo crassius), lateribus ab angulis anticis ad medium leviter divergentibus pone medium sat fortiter dilatato-rotundatis, margine antico fere recto, basi media lobata, angulis posticis acutis retrorsum directis; scutello haud transverso postice acuto; elytris obscure rugulosis, antice manifeste convexis, lateribus postice subtiliter denticulatis; prosterno fere ut pronotum sed paullo magis rugulose, abdomine sat æqualiter (ad latera paullo magis crebre) punctulatis; segmento ventrali apicali leviter late emarginato. Long., $2\frac{4}{5}$ l.; lat., 1 l.

The elytra of this insect are not shorter than the hind body. The most striking character lies in the shape of the prothorax, that segment increasing in width only gently from the front to about the middle, but thence nearly to the base being much more strongly and more abruptly dilated; the sides, however, owing to the strong curve of their hinder part are convergent close to the base.

Compared with *N. Fortnumi*, Hope, the principal differences (apart from colour and markings) are as follows:—The head is not concave, and its sculpture is not at all longitudinal; the prothorax is differently shaped, and is very much more closely and strongly punctured; the elytra are distinctly less coarsely sculptured.

N. S. Wales; near Sydney.

N. nigricans, sp. nov. Convexiuscula; sparsim pubescens; tota nigro-ænea; capite plano vel potius subconvexo, crebre fortiter subrugulose punctulato; prothorace fortiter transverso, confertim rugulose punctulato, lateribus ab angulis anticis fere ad basin leviter arcuatim divergentibus, margine antico fere recto, basi media lobata, angulis posticis acutis retrorsum directis; scutello parvo rotundato; elytris sat fortiter rugulosis, antice sat fortiter convexis, lateribus postice subtiliter denticulatis; prosterno fere ut pronotum punctulato; abdomine coriaceo et ad latera sat fortiter squamose punctulato; segmento ventrali apicali toto sat fortiter squamose punctulato, postice sat anguste angulatim nec profunde emarginato. Long., $2\frac{2}{5}$ l.; lat., 1 l.

This species is very like the preceding, and I have felt some doubt as to whether its differences might be merely sexual, but I do not think this can be the case. It is a shorter and wider insect, with the apical ventral segment differently shaped, and all the ventral segments differently sculptured. These characters are very likely to be sexual, but in addition the colour is widely different, the whole sculpture of the upper surface is more rugulose, the outline of the prothorax is different, and the front

margin of the elytra is quite strongly produced, instead of being only gently convex.

N. S. Wales; Blue Mountains.

MELOBASIS.

M. Derbyensis, sp. nov. Supra viridi-aurea, subtus viridis vix auratus; nitida; fere glabra; capite plano confertim fortiter punctulato et pilis brevibus albidis dense vestito; prothorace quam longiori duplo (postice quam antice fere tertia parte) latiori, nullo modo canaliculato, sat fortiter minus crebre latera versus magis crebre (fere ut *M. vernæ*, Hope, sed paullo minus fortiter) punctulato, lateribus vix arcuatis, margine antico leviter emarginato vix bisinuato, basi bisinuata, angulis posticis sub acutis leviter retrorsum directis: elytris punctulato-striatis, latera versus striis obsoletis et puncturis confusis, interstitiis suturam versus subtilissime sparsissime punctulatis, lateribus postice denticulatis; prosterno antice declivi. Long., $5\frac{1}{2}$ l.; lat., 2 l.

The prothorax scarcely differs from that of *M. verna*, Hope, in any respect except that the front margin is scarcely at all bisinuate, and that the puncturation is a trifle finer. The elytra are very much more distinctly striated than in that species, the nterstices of the striæ being almost lævigate. The puncturation of the underside is evidently finer than in *M. verna*. The following characters in combination will, I think, distinguish it from all its described congeners; colour of upper surface bright greenish-golden, head flat, pubescent and very closely punctured, prothorax without any trace of a dorsal line beyond a faint scratch at the base only discernible in certain lights, elytra quite devoid of costæ, but exceptionally distinctly striate.

N.W. Australia; King's Sound; in the collection of C. French, Esq.

STIGMODERA.

S. minuta, sp. nov. Sat angusta; capite viridi, prothorace aureo-cupreo viridique iridescenti, elytris cupreo-nigris singulis maculis 4 flavis ornatis, corpore subtus pedibusque cyaneis; capite planato crebre fortiter punctulato; prothorace quam longiori fere dimidio latiori, postice quam antice tertia parte latiori, fortiter convexo, perspicue canaliculato, crebre subtilius (quam caput minus fortiter) punctulato, lateribus leviter arcuatis, basi fortiter bisinuata in medio lobata, angulis posticis acutis; elytris sat fortiter striatis, basi antrorsum late sat fortiter arcuatim prominulis, apice oblique emarginatis et 2-spinosis, interstitiis convexis punctulatis alternis postice magis elevatis; corpore subtus fere glabro sat fortiter punctulato. Long., 3 l.; lat., 1 l.

The spots on each elytron are a nearly circular one between the scutellum and shoulder, an oblong one placed longitudinally on the lateral margin a little behind the base, a fascia-like one about the middle, touching the lateral margin but not the suture and roundly dilated at its inner extremity, and an arched fascia-like one a little before the apex touching the lateral margin but not the suture.

Of the section of *Stigmodera* having the underside and also the prothorax unicolorous, the elytra of two colours and the apex of the elytra spined, the following very small species have been described :—*sexguttata*, Macl. ; *bella*, Saund. ; *hilaris*, Hope ; *liliputana*, Thoms. ; *parva*, Saund. ; *triguttata*, Macl. ; *læna*, Thoms. Of these only the first and last bear any marked resemblance to the present species. *S. sexguttata*, Macl., seems to differ considerably in the markings, and also in having the head broadly impressed and "very finely" punctured, while *læna*, Thoms., from W. Australia, differs *inter alia* by the hindmost yellow mark on its elytra being straight.

Queensland ; sent to me by C. French, Esq.

S. septemmaculata, sp. nov. Minus lata ; minus depressa ; supra sat glabra, subtus sat dense albido-pubescens ; obscure ænea, elytris testaceis, basi anguste æneis, maculis 7 nigro-purpureis ornatis (sc. communibus in sutura 3 utrinque marginem lateralem versus 2, posterioribus 2 in sutura conjunctis) ; capite prothoraceque confertim subfortiter (fere ut *S. amphichroæ*, Boisd.) punctulatis ; illo longitudinaliter concavo ; hoc subgibboso, canaliculato, quam longiori plus quam dimidio (postice quam antice vix dimidio) latiori, lateribus sat fortiter arcuatis, basi leviter bisinuata, angulis posticis acutis ; elytris punctulato-striatis, basi late læviter arcuatis, apice oblique emarginatis et bispinosis (spinis nigris), interstitiis subtiliter sat crebre punctulatis ; corpore subtus crebre subtilius (prosterno medio postice magis sparsim magis fortiter) punctulatis. Long., $4\frac{4}{5}$ l. ; lat., $1\frac{3}{5}$ l.

The submarginal spots on the elytra are placed one a little behind the shoulder, the other scarcely behind the middle ; the sutural spots are placed one about a quarter of its length from the base, one (of a diamond shape) slightly behind the middle and one near the apex, the hinder two being narrowly connected on the suture.

This is a very distinct species, a little like *S. 6-guttata*, Macl., but much larger, and very differently coloured, with the elytra very much more deeply emarginate at the apex, the apical spines (especially the external ones) very much larger, &c.

S. Australia ; Lyndoch ; in the S. A. Museum.

S. Skusei, sp. nov. Tota læte cœrulea certo adspectu viridimicans, elytris antice ad latera et postice ante apicem transversim flavis exceptis ; capite longitudinaliter concavo sat crebre sat fortiter punctulato ; prothorace quam longiori (et postice quam antice) paullo plus quam dimidio latiori, basin versus in medio fortiter minus crebre punctulato (hinc antrorsum et latera versus gradatim magis crebre magis rugulose, antrorsum magis subtiliter punctulato ; prothorace ut *S. 8-spilotæ*, Saund., sculpturato), lateribus fere a basi ad apicem arcuatim convergentibus, basi fortiter bisinuata, angulis posticis acutis ; elytris punctulato-striatis, basi antrorsum late sat fortiter arcuatim prominulis, apice oblique emarginatis, intus breviter extus fortiter spinosis, lateribus pone humeros late minus fortiter dilatatis postice denticulatis, interstitiis sparsim minus subtiliter punctulatis, antice suturam versus subplanis, latera apicemque versus sat convexis ; corpore subtus sat crebre sat fortiter punctulato, breviter sparsim albido-pubescenti. Long., $6\frac{1}{2}$ l. ; lat., $2\frac{3}{5}$ l.

A very pretty and distinct species, entirely (except the yellow parts of the elytra) of a rich blue colour with greenish reflections in certain lights. The elytra are more easily described if the yellow be regarded as the ground colour. The blue then appearse as a very wide common sutural vitta (about as wide as each of th yellow lateral spaces) extending from the base to slightly beyond the middle of the length, where it merges in a straight fascia of the same colour (both margins of which, however, are sinuous), the front of which is a little behind the middle of the elytra ; each elytron also bears a small blue spot occupying its inner apex.

N. S. Wales ; taken in the Blue Mountains by Mr. Skuse.

S. hostilis, sp. nov. Nigro-ænea, elytris flavo-brunneis nigro-trifasciatis, externe rubro marginatis ; fasciis in sutura conjunctis ; prothorace quam elytra multo angustiori creberrime subtilius (basin mediam versus sparsius magis fortiter) punctulato ; elytris punctulato-striatis, interstitiis crebre punctulatis antice suturam versus sat planis latera apicemque versus convexis, ad apicem singulatim trispinosis; corpore subtus dense sat longe piloso. Long., $5\frac{1}{2}$ l. ; lat., $2\frac{1}{5}$ l.

The base of the elytra, which is narrowly black, is very distinctly wider than the base of the prothorax, and is distinctly and minutely dentiform at its humeral angles ; it is widely arcuately and somewhat evenly arched forward. The front fascia is a little behind the base and is straight, its lateral apices a little produced forward, its middle with a small triangular projection nearly touching the scutellum ; it does not reach the lateral

margins. The second fascia is immediately behind the middle of the length, and touches the lateral margins; it is straight and nearly twice as wide as the front fascia, its lateral apices considerably dilated. The hindmost fascia is somewhat of a half-moon shape,—viewed with the head of the insect next the observer, it resembles an open umbrella,—and is near the apex. The prothorax, at its widest, is scarcely more than three-quarters the length of the widest part of the elytra; it is half again as wide as long, and nearly twice as wide across the base as across the front. Its puncturation is about as close as that on the prothorax of *S. amphicroa*, Boisd., but is a trifle finer (except in front of the scutellum where it is stronger and less close), and less rugulose. Its form is strongly convex in all directions, so that it appears decidedly gibbous. The head is moderately elongate and moderately concave longitudinally; its puncturation is much like that of the prothorax. The underside is closely and finely punctured.

This species seems to be near *Burchelli*, L. & G., but differs from it and its described allies by the the trispinose apex of each of its elytra; of the three apical spines the middle one is the largest and the least acute; the others are small and sharp.

W. Australia; near York; sent by C. French, Esq.

S. sternalis, sp. nov. Brevis; lata; depressa; fere glabra; cœrulea, capite prothoraceque supra æneis, antennis viridibus, elytris testaceis ad basin anguste obscuris, pone medium fascia angusta et in apice macula communi subquadrata nigris ornatis; capite longitudinaliter concavo, fortiter minus crebre (postice minus fortiter magis crebre) punctulato; prothorace quam longiori (et postice quam antice) duabus partibus latiori, sparsim subfortiter (latera versus paullo magis fortiter magis crebre) punctulato, lateribus a basi ad apicem arcuatim convergentibus, basi media late angulatim lobata, angulis posticis acutis; elytris striatis (striis sat fortiter punctulatis), basi antrorsum fortiter angulatim prominulis, apice emarginatis et bispinosis, lateribus pone humeros minus late sat fortiter dilatatis, interstitiis sparsim subfortiter punctulatis suturam versus in medio sat planis (basin apicem lateraque versus carinatis); corpore subtus subtiliter minus crebre punctulato; canali sternali elevato. Long., $5\frac{4}{5}$ l.; lat., $2\frac{4}{5}$ l. (vix).

Extremely like *S. Andersoni*, L. & G. It is a shorter and more depressed insect, with the elytra much more dilated behind the middle. The prothorax is much more strongly and sparsely punctulate, and is without any trace of a fovea in the hind angles; the scutellum is much less transverse; the punctures in

the elytral striæ and also on the interstices are much stronger, the interstices are very much more convex ; the underside is of a bright blue colour, and the pectoral excavation (receiving the prosternal process) is strongly elevated ; the pubescence of the underside and legs is very thin and inconspicuous. The external angle of the base of the elytra is strongly defined and directed outward. The apical spot on the elytra is not connected on the suture with the transverse fascia.

S. Australia ; in the collection of C. French, Esq.

S. Macleayi, sp. nov. Sat lata; subtus modice albido-pubescens ; obscure viridis ; elytris testaceis, basi anguste viridi, sutura late viridi (colore viridi pone scutellum dilatato, mox pone medium fasciam externe violaceam ad latera emittenti, paullo ante apicem in macula magna transversa dilatato, circa apicem recurvato), macula sat parva violacea pone humeros oblique posita ; capite prothoraceque creberrime subtilius punctulatis ; illo inter oculos longitudinaliter concavo ; hoc quam longiori vix dimidio (postice quam antice fere duplo) latiori, lateribus a basi ad apicem rotundatim convergentibus, basi media angulatim lobata, angulis posticis acutis ; elytris striatis (striis subtiliter punctulatis), basi antrorsum late trisinuatim minus fortiter prominulis, apice oblique emarginatis et bidentatis, dentibus externis majoribus, lateribus pone humeros modice dilatatis, interstitiis fere ut *S. sternalis* set multo magis crebre punctulatis ; corpore subtus confertim punctulato. Long., 6 l.; lat., $2\frac{1}{5}$ l.

The colour of the markings on the elytra is peculiar, the base and extreme suture being green, all the other markings deep violet. The markings on the elytra are almost exactly (save that the post-humeral spot and the post-scutellar dilatation are smaller) as depicted in the figure of *S. audax*, Saund. (Ins. Saund., III., 1, t. 1, fig. 7), which, however, is a very different insect in other respects. The base of the elytra is of the same width as the base of the prothorax, their humeral angle is acute, but scarcely dentiform. The puncturation of the head and prothorax is as in *S. ocelligera*, L. & G. Perhaps near *S. Masteri*, Macl., which, however, is described as a smaller species of a brassy or bluish-black colour, the anterior spots on the elytra as adjoining the scutellum, the apices of the elytra strongly bispinose and not marked with dark colour, &c. The description of puncturation, &c., is not definite enough for comparison. Also near *cyanicollis*, Boisd., differing *inter alia* by its prothorax at the widest across the base and more closely punctulate.

Queensland ; in the collection of C. French, Esq.

S. equina, sp. nov. Minus elongata; sat depressa; supra glabra,

subtus sat dense argenteo-pubescens; brunneo-cuprea, elytris flavis, ad basin anguste cyaneis vittis fasciisque brunneo cupreis ornatis (sc. pone humeros utrinque vitta arcuata—his fascia transversa conjunctis—fascia mox pone medium posita, macula magna apicali et a fascia antemediana ad apicem sutura); capite medio longitudinaliter canaliculato, fortiter sat crebre punctulato; prothorace quam longiori (et postice quam antice) plus quam dimidio latiori, subfortiter minus crebre punctulato, lateribus rotundatis postice sinuatis, basi leviter bisinuata, angulis posticis acutis; scutello viridi concavo; elytris punctulato-striatis, basi subrectis, apice emarginatis (haud oblique) et bispinosis, lateribus pone humeros sat fortiter subangulatim dilatatis postice subtiliter denticulatis, interstitiis sparsim subfortiter punctulatis sat convexis; corpore subtus leviter crebre punctulato. Long., $4\frac{4}{5}$ l.; lat., $1\frac{4}{5}$ l.

In the unique example before me there is a large round fovea on either side of the disc of the prothorax, which, however, may be accidental.

The markings on the elytra are much like those of *S. simulata*, L. & G. (as depicted in Tr. Ent. Soc., 1868, t. 3, fig. 5); the markings on the front half of the elytra differ only in the transverse fascia (connecting the lateral vittæ) having its front margin straight (*i.e.*, not produced forward on the suture); the postmedian fascia differs in not being dilated near the lateral margin, and having both its front and hind edge evenly arched on either side (not flexuous); the apical spot is quite different, being somewhat like that of *S. thoracica*, Saund. (as depicted Jour. Linn. Soc., vol. IX., t. 9, fig. 11),—from a certain point of view the portion of it on each elytron bears a rough resemblance to a horse's head, the apical spines being regarded as the animal's ears. The apical emargination of each elytron is *quite* apical (not at all oblique), and the spines on either side of the emargination are well defined and equal. I incline to place this species near *simulata*, although it differs much in its much smaller size, more depressed form, prothorax wider at the middle than at the base and much less closely punctured, &c I am doubtful of the sex of my example.

S. Australia; near Port Lincoln.

S. quadrinotata, sp. nov. Sat elongata; sat depressa; postice latior; supra glabra subtus breviter minus dense pubescens; capite prothoraceque subaureo-viridibus, scutello viridi, elytris testaceis externe rufescentibus (sutura viridi, basi apice et fasciis 3 cyanescentibus), corpore subtus viridi, pedibus plus minusve violaceis, capite longitudinaliter concavo; protho-

race quam longiori et postice quam antice dimidio latiori, lateribus ab angulis anticis fere ad basin rotundatim divergentibus, basi valde bisinuata, angulis posticis acutis; elytris punctulato-striatis, basi fortiter antrorsum rotundato-productis, apice oblique emarginatis et bispinosis, lateribus pone humeros modice dilatatis interstitiis sparsim punctulatis alternis convexis. Long., $4\frac{1}{5}$ l.; lat., $1\frac{3}{5}$ l.

Not unlike *S. quadrifasciata*, Saund., but much smaller and differently coloured; also the pattern on the elytra is different, the ante-median fascia being dilated (not contracted) on the suture, and reaching the lateral margins; it resembles the corresponding fascia in *S. carminea*, Saund. (as depicted in Journ. Linn. Soc., vol. IX., tab. 10, fig. 32). The post-median fascia is very like that of *S. 4-fasciata* (as depicted loc. cit., fig. 39). The ante-apical fascia resembles the ante-median one reversed. All the fasciæ touch the external margins.

Victoria; in the collection of C. French, Esq.

N.B.—I have seen an example (from N. S. Wales) of this species in which the anterior two fasciæ of the elytra are both interrupted on either side on the disc, so that in place of those fasciæ there are two large marginal or submarginal spots on each elytron placed opposite (but not joining), corresponding dilatations of the suture. It is just possible that this variety may be *S. disjecta*, Kerremans, although it does not agree well with the description, especially in colour, the underside not being at all coppery, nor the apical part of the elytra red; but even if it should prove identical, the form I have called *S. 4-notata* is certainly deserving a name as a var.

S. dispar, sp. nov. Modice elongata; minus depressa; supra glabra, subtus sparsim breviter pubescens; læte viridis, elytris testaceis; capite prothoraceque confertim subtilius punctulatis; illo medio longitudinaliter canaliculato; hoc quam longiori (et postice quam antice) dimidio latiori, lateribus fortiter rotundatis, basi media fortiter lobata, angulis posticis minus acutis; elytris punctulato-striatis, basi valde subangulatim antrorsum productis, apice oblique minute emarginatis et bidenticulatis interstitiis sat crebre punctulatis (alternis antice, omnibus postice, sat convexis); corpore subtus crebre, prosterno medio sat sparsim, punctulato. Long., $3\frac{4}{5}$ l.; lat., $1\frac{2}{5}$ l.

The extremely brilliant green colour of every part, except the elytra—these being of a yellowish testaceous colour, without the slightest trace of any marking—will, I think, distinguish this from all the other *Stigmoderæ* of small size.

Queensland; in the collection of C. French, Esq.

S. canaliculata, sp. nov. Sat elongata; minus depressa; supra fere glabra, subtus sparsim breviter pubescens; nigra, elytris rufis, sutura postice nigra (colore nigra ante apicem abbreviata et hic rotundatim dilatato; capite crebre sat fortiter punctulato, longitudinaliter profunde concavo; prothorace quam longiori (et postice quam antice) plus quam dimidio latiori, profunde canaliculato, in medio crebre subtilius punctulato et transversim rugato latera versus sat crasse ruguloso, lateribus ab angulis anticis longe ultra medium divergentibus ante basin sat fortiter rotundatis, basi bisinuata, angulis posticis acutis; elytris striatis (striis puncturis magnis sparsis parum distinctis instructis), basi fortiter rotundatim antrorsum productis, apice oblique emarginatis et bispinosis, lateribus postice subtiliter denticulatis, interstitiis confertim punctulatis alternis modice convexis; corpore subtus subtilius sat crebre punctulato, prosterno medio crebre sat crasse ruguloso. Long., 3 l.; lat., $1\frac{1}{10}$ l

Near *S. erythroptera*, Boisd., but *inter alia* very much smaller and narrower, with the prothorax less strongly punctured on the disc, the prosternum much more closely rugulose (this may not be the case in both sexes), the dark colour of the suture expanding into a rounded spot considerably before the apex, and not continued behind the spot. Also near *S. nanula*, Kerremans, which, however, has the apex of the elytra black and rounded.

Queensland; in the collection of C. French, Esq.

S. arborifera, sp. nov. Modice lata; minus convexa; supra fere glabra, subtus sat dense argenteo-pubescens; nigra, obscure hic illic purpureo-vel cyaneo-micans, elytris flavo-ornatis (sc. in elytris singulis vitta sat lata discoidali a medio fere ad basin attingenti, margine laterali angusto a basi ultra medium postice dilatato, et macula semilunulari apicali externe convexa); capite prothoraceque sat crebre sat fortiter (ut *S. Australasiæ*) punctulatis; illo in medio longitudinaliter sulcato; hoc quam longiori dimidio (postice quam antice paullo plus quam dimidio) latiori, lateribus sat arcuatis pone medium leviter sinuatis, basi leviter bisinuata, angulis posticis acutis; elytris sat fortiter punctulato-striatis, basi late vix arcutis, apice fortiter (vix oblique) emarginatis et bispinosis, lateribus postice subtilissime denticulatis, interstitiis sat convexis sat crebre punctulatis; corpore subtus crebre subtilius (in medio sparsim) punctulatis; prosterno medio sparsim minus fortiter punctulato. Long., $5\frac{1}{2}$ l.; lat., $2\frac{1}{10}$ l.

If yellow be regarded as the ground colour of the elytra, the

black markings (the insect being looked at with its head next the observer) appear as three parallel wide vittæ, connected (along the base, and also a little behind the middle) at their extremities by transverse fasciæ; while the apical quarter of the elytra is occupied by a spot bearing a rough resemblance to the figure of a tree standing on the hinder transverse fascia, and not reaching the apex, except very narrowly along the suture. This species is not unlike *S. Wilsoni*, Saund., but besides considerable difference in pattern, the prothorax is considerably wider across the base than across the middle, &c.

Australia; I am doubtful of the exact habitat; in S. A. Museum.

S. marcida, sp. nov. Sat angusta; viridis, elytris (sutura in medio basique anguste viridibus exceptis) rufis; capite inter oculos leviter concavo, sat crebre minus fortiter (fere ut *S. viridicinctæ*, Waterh.), punctulato; prothorace quam longiori fere duplo (postice quam antice circiter dimidio) latiori, vix manifeste canaliculato, pernitido, inæqualiter sat fortiter sat crebre (fere ut *S. flavomarginatæ*, G. & H., sed latera versus magis crebre magis rugulose) punctulato, lateribus modice sat æqualiter arcuatis, basi bisinuata (in medio vix distincte lobata), angulis anticis minus distinctis posticis sat acutis; elytris sat fortiter striatis (interstitiis transversim subtiliter rugatis sparsim subfortiter punctulatis) ad apicem leviter emarginato-truncatis, angulis suturalibus sat acutis vix prominulis, basi leviter æqualiter arcuata; corpore subtus pilis pallidis sat dense vestito, sat crebre sat fortiter punctulato.

Maris segmento ventrali apicali apice profunde arcuatim emarginato. Long., 12 l.; lat., $4\frac{2}{5}$ l.

The width of the prothorax is to its length down the middle as 19 to 11. The species in general appearance is suggestive of *S. flavomarginata*, G. & H., but differs from that species (apart from colour) *inter alia* by its narrower form, and especially by its longer head with the clypeus emarginate in front, and its prothorax evenly arched at the sides, whereas in *flavomarginata* the prothorax is at its widest a little in front of the base and thence narrows forward with sides but little curved.

The middle part of the prosternum is punctured rather strongly and closely, scarcely less so than the middle part of the ventral segments; this, however, is very likely not the case with the female. In my example of *flavomarginata*, which seems also to be a male, the apical ventral segment is only slightly emarginate (almost truncate) behind, and the middle part of the prosternum is very finely and sparsely punctulate.

W. Australia; in the collection of C. French, Esq.

S. Andersoni, L. & G., var. *terminalis*, Kerremans. This must be very close to, if not identical with, *S. brutella*, Thoms. I believe it to be a good species.

S. Melbournensis, Thoms. This species must be very close to, if not identical with, *S. Australasiæ*, L. & G.

S. Carpentariæ, sp. nov. Sat lata; minus convexa; postice sat angustata; fere glabra; prothorace rufo antice posticeque et in disco viridi-tincto; scutello viridi; elytris rufo-testaceis rubro-cinctis, margine antica angusta macula oblonga transversa pone medium posita sutura postice et apice viridibus; corpore subtus rufo-testaceo, prosterno medio cum maculis nonnullis in meso et meta-sternis et in abdomine segmentum ventralium marginibus transversis et pedibus (his nihilo minus rufo-maculatis) viridibus; capite fere plano crebre sat fortiter punctulato; prothorace quam longiori duabus partibus (postice quam antice fere duplo) latiori, subfortiter minus crebre sat æqualiter punctulato, lateribus postice fere parallelis antice ad angulos anticos sinuatim fortiter convergentibus, basi media late lobata; elytris punctulato-striatis, ad basin externam subquadratim productis (fere ut *S. viridicinctæ*, Waterh.), ad apicem fortiter emarginatis (spinis externis parvis, suturalibus magnis), interstitiis crebre punctulatis antice transversim rugulosis. Long., 13 l.; lat., $5\frac{1}{5}$ l.

A very distinct species somewhat resembling *S. vitticollis*, Macl., in general style of marking on the upper surface.

N. Queensland; Gulf of Carpentaria; in the collection of C. French, Esq.

S. ornata, sp. nov. Minus lata; minus convexa; fere glabra, subtus sparsim albido-pubescens; capite prothorace scutelloque læte cupreo-viridi-cyaneoque versicoloribus, corpore subtus splendide aureo, pedibus viridi purpureoque micantibus, elytris testaceis, his macula magna communi basali (prothoraci magnitudine formaque simili) fascia mediana lata et macula communi elongata apicali nigris ornatis; capite prothoraceque confertim sat fortiter punctulatis; illo longitudinaliter concavo; hoc quam longiori (et postice quam antice) plus quam dimidio latiori, lateribus leviter arcuatis, basi leviter bisinuata; elytris punctulato-striatis, ad basin subrectis, ad apicem rotundatis, interstitiis convexis sparsim punctulatis; corpore subtus crebre nec fortiter punctulato.

Maris segmento ventrali apicali postice late sinuato-truncato, prosterno medio fortiter sat crebre punctulato. Long., $6\frac{1}{2}$ l.; lat., $2\frac{1}{2}$ l.

This is a very beautiful and very distinct species. The mark

ings on the elytra bear considerable general resemblance to those of *S. grata*, Saund. These markings are all connected on the suture; the basal one is a spot nearly as large as the area of the prothorax, and not unlike it in shape, touching the base along about three-quarters of its width, but not touching the lateral margins; the space between the basal spot and the median fascia is narrowly black on the suture, and is very short; the median fascia touches the lateral margins very narrowly, its front edge is somewhat triangular, its hind edge sinuous; the median fascia is joined on the suture by a wide stem to the apical spot, which is somewhat elongate-quadrate, and very similar in form and size to the apical spot of *S. thoracica*, Saund. (depicted Journ. Linn. Soc., vol. IX., tab. 9, fig. 11).

Victoria; in the collection of C. French, Esq.

S. longula, sp. nov. Sat elongata; subdepressa; subglabra; cærulea, prothoracis lateribus elytrorum fasciis 2 latis suturam haud attingentibus altera mox ante medium externe antrorsum producta, altera subapicali externe retrorsum producta) prosterni lateribus abdominis lateribus (macula utrinque in segmentis 2-4 positis exceptis) macula in segmento ventrali penultimo medio posita et segmento ventrali apicali testaceo-rufis; capite longitudinaliter profunde sulcato, crebre minus fortiter punctulato; prothorace quam longiori plus quam dimidio (postice quam antice fere duplo) latiori, sparsim vix fortiter punctulato, lateribus incrassatis fortiter rotundatis, basi leviter bisinuata; elytris punctulato-striatis, ad basin late nec fortiter arcuatis ad apicem emarginatis et bispinosis, spinis externis valde elongatis, interstitiis sparsius punctulatis subplanis latera apicemque versus magis convexis.

Mas latet.

Feminæ prosternomedio sparsim parum fortiter punctulato. Long., 9 l.; lat., $3\frac{3}{5}$ l.

The shape of the prothorax is very unusual in the genus, the sides being strongly rounded, so that the base is much narrower than the widest part, and the widest part being exceptionally far from the base—indeed, a line drawn across the prothorax at its widest would intersect the median longitudinal line in front of its middle; the sides of the prothorax are incrassated, and limited by a sulcus, as in *S. variabilis*, Don. The red lateral margins of the prothorax are so wide as together to equal the dark intermediate space.

I hardly know to what species to compare this; its elytra spinose at the apex in combination with red-margined prothorax, underside variegated with red, and elytra fasciated, place it in a

section of the genus (as I have roughly and artificially tabulated it) to which *cyanipes*, Saund., and numerous other species belong; *cyanipes* is very variable in markings, and one of its varieties (not that figured by Mr. Saunders) scarcely differs from the present insect in markings, except in the hinder red mark being less produced hindward on the margin, so that the hinder dark mark has a nearly straight edge in front reaching from margin to margin; whereas in *S. longula* this dark mark appears as a subquadrate spot, placed and shaped much as in *S. cruenta*, L. & G. (as figured by Saunders, Tr. Ent. Soc., 1868, t. 2, fig. 21). But this insect is very unlike *S. cyanipes* in other respects, and recalls to mind, I think, very differently-coloured species (*e.g.*, *S. cruenta*) by its shape, while it stands almost, if not quite, alone in its prothorax being at the widest (to the eye considerably, and by measurement a little) in front of the middle of the median line, while at the same time the prothorax is much wider at this point than at the base; the prothorax of *S. sanguinea*, Saund., approaches somewhat to this form, but besides having its sides less converging hindward, it has not the thickened lateral margins separated from the disc by a sulcus.

Victoria; in the collection of C. French, Esq.

EUCNEMIDÆ.

DYSCOLOCERUS.

I have some hesitation in referring the following species to this genus. M. de Bonvouloir, in his monograph of the *Eucnemides*, attaches great importance to the relative length of the joints of the antennæ, and notes *Dyscolocerus* as very remarkable on account of joints 4-8 of the antennæ being very short and transverse, hardly longer together than the ninth. In the present insect joints 4-8 are strongly transverse (joint 4 a little longer and less transverse than the following) and are together distinctly shorter than joint 9; joint 10 is distinctly, though not much, shorter than 9, and 11 is the longest joint of the antennæ, being nearly half again as long as 10. In *Dyscolocerus* the apical joint is much smaller than the tenth. I think it not unlikely that M. de Bonvouloir would consider this sufficient difference to call for a new generic name, but as the general characters seem in other respects to agree with *Dyscolocerus*, and the *species* seems considerably to resemble the unique species ascribed to *Dyscolocerus*, there seems no great objection to place it provisionally in that genus. It agrees with *Dyscolocerus* in the form of its posterior coxæ (prolonged over the base of the femora and beginning to narrow outward much nearer to their inner than their external extremity), the absence of tarsal sulci on the

abdomen of prosternal sulci and of tarsal lamellæ, the prothorax not having more than one marginal carina, the mandibles of ordinary structure, the clypeus simply rounded in front, the prosternal sutures straight, and the epistoma much narrowed at its base, and much bent under the head.

D. heros, sp. nov. Oblongo-elongatus; modice convexus; postice leviter attenuatus; aterrimus, elytris et prothoracis angulis posticis rubris; capite prothoraceque crebre rugulose nec crasse punctulatis; illo in medio longitudinaliter leviter impresso; hoc fortiter transverso, canaliculato, antice manifeste angustato, ante basin utrinque oblique impresso; elytris pube densa nitida læte rubra vestitis, striatis, sat dense vix rugulose punctulatis, interstitiis leviter convexis. Long., 6 l.; lat., $2\frac{1}{5}$ l.

This is by far the finest Australian *Eucnemid* I have seen. N. S. W.; Blue Mountains.

CURCULIONIDÆ.

DYSCHŒNIUM.

Attention is called in the Zool. Record., 1890, to my having omitted to state categorically to what group of *Curculionidæ* this genus should be referred. Its place is among the *Erirhinides*, as the Recorder rightly conjectures from its place in my memoir, where it stands between two *Erirhinid* genera.

LONGICORNES.

TRYPHOCHARIA.

T. Mitchelli, Hope. The insect which I suppose must be this species, and which I have seen, I believe, from several localities in N. S. Wales and Queensland, does not agree very well with the figure [Tr. Zool. Soc., III. (2), t. 12, fig. 8] in respect of markings. It is very much like *T. Mastersi*, Pasc., but differs in having a small sharp spine (not a blunt tubercle) on either side of the prothorax, in the more coarsely rugulose puncturation of almost every part, and in the less elongation of the third joint of the antennæ as compared with the fourth; the infuscation of the apical part of the elytra moreover is much less extended forward (though it is likely that this is an unreliable character).

It is also a good deal like *T. Odewahni*, Pasc., differing from it *inter alia* by the bispinose apex of its elytra.

BETHELIUM.

B. tricolor, sp. nov. Setis erectis sparsim vestitum; ferrugineum, prothorace antice posticeque paullo infuscato, elytrorum

parte dimidia apicali lateribusque piceis vel nigris, disco utrinque flavo-bifasciato, (fascia antica angusta a margine retrorsum arcuata, postica lata a margine oblique antrorsum directa) fasciis suturam haud attingentibus; capite crebre punctulato, antice fortiter declivi; antennis maris elytrorum apicem vix superantibus (feminæ manifeste brevioribus), articulo 3° quam 1^{us} vix quam 4^{us} multo quam 5^{us} manifeste longiori, 6°-11° (10°, 11° que paullo brevioribus exceptis) 5° subæqualibus; prothorace vix transverso, crebre æqualiter granulato vel rugulose umbilicato-punctulato, lateribus sat fortiter sat æqualiter rotundatis postice vix sinuatis; elytris apice subrotundatis vix sinuato-truncatis, antice sat fortiter sat rugulose (retrorsum gradatim minus fortiter) punctulatis, abdomine infuscato; oculis grosse granulatis. Long., $3\frac{4}{5}$—$4\frac{1}{2}$ l.; lat., $1\frac{1}{10}$—$1\frac{3}{10}$ l.

Although this is by no means a rare insect, it appears to have escaped description hitherto. It is of somewhat broader and more robust form than *B. signiferum*, Newm. In the male the prothorax is by measurement just barely longer than wide, the length and breadth being equal in the female. The dark portions of the elytra are so ordered that the ferruginous part is simply a common patch on the anterior half of the suture occupying the whole base, contracting hindward and then expanding again.

S. Australia; Port Lincoln; also near Adelaide.

B. mundum, sp. nov. Setis erectis sparsim vestitum; rufum, prothorace antice posticeque paullo infuscato, elytris piceis circa scutellum vix rufescentibus fasciis binis angustis subeburneis tortis albidis ornatis, femoribus (basi excepta) abdomineque piceis; cetera fere ut *B. tricoloris* sed prothorace paullo minus fortiter sculpturato. Long., 3 l.; lat., $\frac{4}{5}$ l.

I can hardly specify any difference between this and the preceding species except in the diminutive size of this, and the very different markings of its elytra, which consist of two slightly-raised transverse zigzag lines, one a little in front of the middle, almost hair-like in its narrowness, and scarcely reaching the suture; the other a little behind the middle, somewhat wider, less zigzag, and distinctly reaching the suture. This insect must be very like *Ectosticta eburatum*, Pasc., but its coarsely-granulated eyes place it far from *Ectosticta*, and moreover its prothorax could not possibly be described as having "coarse crowded punctures," the sculpture of its prothorax presenting the appearance rather of small almost-effaced granules.

N. S. Wales; Mulwala; sent to me by Mr. Sloane.

SISYRIUM.

The discrimination of generic characters in the numerous

species closely related to *Sisyrium* seems to be most difficult. M Lacordaire says that complete identity exists between that genus and *Acyrusa*, except in the latter having a spine at the apex of the third joint of the antennæ, and a pubescent fovea on either side of the basal four ventral segments. I have not seen any species presenting these characters, but I have before me an insect from western S. Australia, and another from near Adelaide, having a pubescent fovea on either side of the third and fourth ventral segments, but no spine on the antennæ. I have also a species from western S. Australia having the antennal spine, but no ventral foveæ; and a fourth species from the same locality devoid of both characters, neither of which appears to be sexual. The last-mentioned of the above species is possibly, but not probably, a variety of *S. stigmosum*, Pasc.; in any case its differences from *stigmosum* are so strongly marked that a distinctive name seems desirable; the others appear to be new.

As it seems absurd to go on making a new genus for every new species among insects that might at a casual glance almost pass for being mere varieties of a single species, it seems to me desirable to call them all *Sisyrium*, as none of them possess both the characters on which *Acyrusa* has been distinguished. The last of the following species has the maxillary palpi much longer than the labial (a divergence which M. Lacordaire allows within the limits of the allied genus *Callidiopsis*), and also has the anterior coxæ more prominent than is usual in the subfamily; a little more prominent even than in *Diatomocephala*.

S. stigmosum, Pasc., var.? *vittatum*.

A *S. stigmoso* differt colore. Rubro-ferrugineo, elytris nigro-notatis, macula antica in vittam nigro-piceam (a basi ad fasciam antiapicalem integram) elongata; prothorace quam latiori circiter quarta parte longiori; pedibus unicoloribus. Long., $4\frac{1}{2}$ l.; lat., 1 l.

Apart from the characters mentioned above, the description of *S.* (*Igenia*) *stigmosum* applies very well to the present insect. It will be noticed that the colouring and the pattern on the elytra are considerably different, and that the prothorax is very much less elongate than that of *S. stigmosum* is said to be. Unless, however, Mr. Pascoe *measured* the proportions, his statements on the point are probably worthless, as the proportions of a prothorax are in few instances by measurement the same they appear to a casual glance.

S. Australia; near Port Lincoln.

S. fraternum, sp. nov. Setis erectis sat sparsim vestitum; ferrugineum, elytris macula communi (literam U simulanti) nigro-fusca ornatis; capite fortiter minus crebre punctulato

inter oculos subapproximatos longitudinaliter ruguloso, antennis (? maris) elytrorum apicem parum superantibus, articulo 3° (hoc ad apicem spina elongata armato) quam basalis breviori quam 4^us^ vix longiori, 5°-11° inter se sat æqualibus quam basalis fere longioribus; prothorace quam latiori parum longiori, ad latera nodoso, supra inæquali fortiter minus crebre punctulato, spatiis lævigatis subconvexis circiter 5 ornato, pone apicem constricto; elytris apice rotundatis seriatim sat regulariter (nisi parte apicali confuse leviter punctulata) puncturis sat magnis subquadratis instructis, his (et seriebus et in seriebus puncturis) sat crebre positis. Long., 4—4½ l.; lat., 1⅕ l. (vix).

Extremely like the preceding, but a slightly stouter form, and distinguishable (apart from the antennal spine) by the very different proportions *inter se* of the antennal joints, and the different pattern on the elytra, which consists of a common mark resembling the letter U, extending almost from the base to the apex; whereas in the preceding the pattern consists of a wide subapical fascia, from the front of which on each elytron (a little nearer to the suture than to the lateral margin) a narrow vitta runs forward nearly to the base of the elytra. The eyes are evidently more approximated above than in any of the allied forms in my collection, and the antennæ are slightly stouter. I cannot but acknowledge the *possibility* that this may be the male of the preceding insect, but if so the sexual differences are certainly very unusual in including a considerable elongation of the third joint of the antennæ in the female. Moreover, as I have two examples of *S. fraternum*, and the pattern on their elytra is absolutely identical, and markedly different from that of the "var. ? *vittatum*," the differences look still less likely to be sexual

S. Australia; west of Port Lincoln.

S. ventrale, sp. nov. Setis erectis sat sparsim vestitum; pallide testaceum, antennis prothorace et corpore subtus (abdomine infuscato excepto) rufescentibus, capite obscuro, elytris fascia lata subapicali (et antice utrinque macula vel vitta discoidali) fusca vel nigra ornatis; capite ut *S. fraterni* sed oculis minus approximatis; antennis elytrorum apicem vix superantibus, articulo 3° quam basalis vix quam 4^us^ multo longiori, ceteris (2° brevi excepto) 3° et inter se subæqualibus; prothorace quam latiori vix longiori, ad latera nodoso, supra inæquali, sparsim crassissime punctulato, spatiis lævigatis circiter 5 ornato, pone apicem constricto; elytris apice rotundatis ut *S. fraterni* sculpturatis; segmentis ventralibus 3°, 4° que utrinque fovea aureo-pilosa ornatis. Long., 3½ l.; lat., ⅘ l.

The hind body with tomentose foveæ on the sides of the third and fourth segments (only) will at once distinguish this species. I have seen about half a dozen examples, among which I do not observe differences likely to be sexual except that the antennæ of some are slightly, and of others not, longer than the body. The mark on the anterior part of the disc of each elytron varies from a small almost square black spot to a vitta of variable length, and is liable to be almost obsolete. It differs from *S. fraternum*, *inter alia*, by the extremely coarse sparse puncturation of its prothorax.

S. Australia; Port Lincoln district; under bark of Eucalyptus.

S. sparsum, sp. nov. Setis erectis sat sparsim vestitum; colore ut *S. ventralis*, sed prothorace (exempli typici) piceo; capite antennisque ut *S. ventralis;* prothorace quam latiori circiter tertia parte longiori, ad latera nodoso, ut *S. ventralis* sculpturato; elytris a *S. ventralis* differt puncturarum seriebus minus crebris et puncturis in seriebus minus crebre positis postice minus obsoletis; segmentis ventralibus ut *S. ventralis* (exempli typici tomento abraso). Long., 3 l.; lat., $\frac{3}{5}$ l. (vix).

Very distinct by its diminutive size and the comparatively sparse puncturation of its elytra, as well as by its comparatively longer prothorax, which is decidedly (and looks much) longer than wide. In the typical example the anterior spot on the elytra is large, square, and black, but probably it is variable.

S. Australia; near Adelaide.

S. lævigatum, sp. nov. Ferrugineum, elytris intra marginem lateralem antice vitta fusca ornatis, mesosterno metasternoque paullo infuscatis; subopacum; supra fere lævigatum; capite quam prothorax fere latiori, linea longitudinali impresso; prothorace leviter transverso, lateribus subangulatim rotundatis; elytris pustulis minutis setiferis 4-seriatim impressis; antennarum articulo 3° quam 1^{us} et quam 4^{us} paullo breviori. Long., $5\frac{1}{2}$ l.; lat., $1\frac{1}{5}$ l.

Perhaps somewhat like *S. (Obrium) ibidionides*, Pasc., although such a conjecture is necessarily not much more than a guess, for the author of that species does not vouchsafe any information upon a point so important even as its puncturation.

W. Australia; Champion Bay; in the collection of C. French, Esq.

The following is a tabulation of the described species attributable to *Sisyrium* (regarding the characters of the genus among the *Callidiopsidæ* as follows:—femora moderately clavate, prothorax not furnished with well-defined callosities, such as those on the prothorax of *Callidiopsis*, head not abruptly declivous in front, elytra with well-defined colours and pattern, antennæ as

long as the body or nearly so, basal and second ventral segments not furnished with tomentose foveæ). I have been obliged to depend on Mr. Pascoe's descriptions for the characters of some of his species.*

A. Elongate species of small size (long., 3-5 l.)
  B. Antennæ devoid of spines.
    C. Ventral segments devoid of tomentose foveæ
      D. Sides of elytra of pale colour in their anterior half.
        E. Prothorax nearly half as long as elytra ... ... ibidionides, Pasc.
        EE. Prothorax much shorter... stigmosum, Pasc.
      DD. Sides of elytra dark, except at base ... ... dorsale, Pasc.
      DDD. Elytra with a dark lateral stripe reaching the base, but not the apex ... lævigatum, Blackb.
    CC. Third and fourth ventral segments with tomentose foveæ
      D. Punctures in rows on elytra close and regular except near apex... ... ... ventrale, Blackb.
      DD. Punctures in rows on elytra much less close ... ... sparsum, Blackb.
  BB. Antennæ with a spine at the apex of the third joint... ... ... fraternum, Blackb.
AA. Robust species of larger size (long., 6 l.) tripartitum, Pasc.

APOSITES.

A. lanaticollis, sp. nov. Rufo-piceus, elytris lividis, elytris pedibusque pilis fulvis (his basin versus albidis) dense vestitis, antennis pube minuta fulva confertim instructis, ceteris partibus pilis albidis vestitis (his in prothorace conspicue condensatis); prothorace rugulose sat crebre punctulato in medio longitudinaliter et lateraliter spatio nitido sublævi instructo, quam latiori fere longiori, subquadrato, antice quam postice manifeste angustiori, lateribus obscure bisinuatis, basi fere truncato, angulis posticis extrorsum sat prominulis; elytris externe fortiter emarginatis, apice angustatis, sat crebre sat squamose punctulatis (basin versus minus crebre minus squamose), singulis leviter 4-costatis, costis apicem fere attingentibus (1ª haud suturæ conjuncta); segmentis ventralibus maculis parvis denudatis ornatis; antennis quam corpus longioribus, articulis 3-11 compressis. Long., 9-10 l.; lat., 2 l.

Much smaller than *A. macilentus*, Pasc., with the prothorax clothed with white woolly pilosity all but entirely concealing the

derm, which, on the removal of the pilosity is seen to be very distinctly punctured, and to have two nitid lævigate stripes placed in the form of a cross. The elytra are gradually narrowed to almost a *point* at the apex, and are very strongly incurved laterally; on each of them are four feeble costæ (besides the lateral margin and suture) of which that nearest to the suture is somewhat widely separated from the latter at the base, but gradually approaches it hindward to about the middle of the elytra, whence to the apex (or nearly so) it runs parallel to the suture.

S. Australia; basin of Lake Eyre.

A. niger, sp. nov. Niger; supra pube subtili fulva vix conspicua, subtus et anguste in elytrorum marginibus pilis griseis sat dense positis vestitus; prothorace transversim crassissime rugato, quam latiori fere longiori, antice quam postice sat angustiori, lateribus a margine antico retrorsum divergentibus (in medio subangulatis, hinc retrorsum convergentibus, juxta basin retrorsum divergentibus), angulis posticis extrorsum sat prominulis; elytris externe leviter emarginatis, apice angustatis, fere ut præcedentis sculpturatis sed costa 1ª paullo pone basin suturæ conjuncta; antennis fere ut præcedentis sed nigræ. Long., $8\frac{1}{2}$—9 l.; lat., $1\frac{4}{5}$ l.

A very distinct species.

W. Australia; near Eucla.

LYGESIS.

It is impossible, I think, in many instances to feel any confidence in determinations arrived at from a study of Mr. Pascoe's work on the *Longicorns*. This genus furnishes a case in point. Mr. Pascoe originally confused it with *Didymocantha*, whose species, as M. Lacordaire remarks, are "very different insects," but subsequently formed a new genus for it and others under the name *Isalium*. Later still Mr. Pascoe discovered that some members at least of his *Isalium* were attributable to a genus long before characterised by the Rev. F. W. Hope under the name *Strongylurus;* so *Isalium* was dropped; and then finally, on further reconsideration still, the author arrived at the conclusion that one of the species originally published as a *Didymocantha* was neither a *Didymocantha* nor a *Strongylurus;* and so another new name (*Lygesis*) was proposed, with a very brief diagnosis, merely mentioning a few characters in which *Lygesis* differs from yet another new allied genus characterised at the same time. If one turns to the description of the typical *species* of *Lygesis* for more information, one finds a description of extreme brevity, in which there is actually no mention whatever of the *puncturation* of the insect.

I have before me an undescribed insect near *Strongylurus* which seems not unlikely to be a *Lygesis;* at the same time I cannot consider the determination at all reliable. I have also a species which is probably *Lygesis mendica*, Pasc. If the latter is right, my examples of it are females; and if so, the insect I am about to describe is probably the male of a *Lygesis* (Mr. Pascoe does not say whether he founded the genus on the male or female). If this species is not a *Lygesis*, it represents a new genus very near to it. The principal differences that I observe consist in the almost contiguous eyes, the much greater length of the antennæ (which are not much less than half again as long as the body), and the very elongate head, which is produced in front of the antennæ to a length slightly exceeding the length of the head behind the antennæ; the intermediate coxæ and adjacent parts are as in *Strongylurus*. The antennæ, moreover, are distinctly compressed, and not much different from those of a female *Opsidota;* but in *Opsidota* the head is not produced anteriorly at all.

L. (?) *ornata*, sp. nov. Sat parallela; setis subtilibus erectis sparsius vestita; nigro-fusca, elytris fere albidis antice et in medio fusco-notatis apicem versus rufo-ferrugineis, antennis pedibusque ferrugineis; capite antice fortiter producto, oculis grosse granulatis permagnis et supra et subtus fere contiguis; prothorace (hoc quam caput parum latiori) quam trans basin latiori fere longiori, subcylindrico, antrorsum nonnihil angustato, crassissime ruguloso, lateribus vix sinuatis; scutello testaceo-pubescenti; elytris (his quam prothorax sat latioribus) apice singulatim rotundatis, antice ut prothorax (retrorsum gradatim minus crebre minus fortiter) sculpturatis. Long., $6\frac{1}{2}$ l.; lat., $1\frac{1}{2}$ l.

The anterior fuscous-black mark on the elytra occupies the whole of the front quarter (and is continued hindward a little on the suture), except a large spot in the middle of the dark space so formed, which is of the prevailing yellowish-white colour; the hinder mark is extremely like the corresponding mark in *Strongylurus scutellatus*, Hope; the apical reddish-ferruginous space is sharply distinguished from the rest of the surface; its front margin is projected forward about at its middle. The narrow strip of the whitish ground colour which lies between the hinder blackish fascia-like mark and the reddish apical patch appears from a certain point of view (*i.e.*, looking across the suture) like the figure "3," owing to the irregularities of outline before and behind it.

Queensland; in the collection of C. French, Esq.

OPSIDOTA.

It is not entirely without hesitation that I refer this species to *Opsidota*, but I think the structural characters are sufficiently close to justify my doing so—at any rate provisionally. The style of marking is very suggestive of *Phoracantha*, the upper surface is nearly devoid of pubescence, the antennal joints while very distinctly compressed are less so than in *O. infecta*, Pasc., and the basal ventral segment is a little longer than in that insect. The following characters, however, bring it very near to *Opsidota;* eyes coarsely granulated, intermediate coxal cavities closed externally, anterior coxal cavities open behind, head short, antennæ (in the male) much longer than the body, their joints not spinose rather strongly compressed (but only slightly more produced at their inner than their outer apex), elytra rounded at the apex but having the sutural angle produced in a short spine, legs moderately elongate, the femora not clavate, antennæ not ciliated beneath but with a few long hairs at the apex of the joints, their third and fourth joints about equal in length.

O. guttata, sp. nov. Nigra, elytris singulis maculis 3 flavis ornatis; macula antica transversim subreniformi paullo pone basin posita, macula submediana transversa, macula subapicali parva fere circulari; prothorace crassissime ruguloso, ad latera inæquali nec spinoso, pone medium spatio lævi ornato; elytris antice crassissime rugulose, postice multo subtilius nec rugulose, punctulatis, apice rotundatis, sutura ad apicem spinosa; antennis quam corpus multo longioribus, articulis sat compressis, 3° 4° longitudine æquali; unguiculis divaricatis. Long., 8—10 l.; lat., $2\frac{1}{5}$—3 l.

S. Australia (interior); also W. Australia (near Eucla).

BEBIUS.

B. variegatus sp. nov. Elongatus; cylindricus; pilis elongatis erectis sparsim vestitus; ferrugineus, femoribus anticis abdomineque obscuris, elytris fascia mediana angulata flava (hac antice posticeque nigro-marginata, spatio nigro postico maculam parvam flavam ferenti) ornatis; capite prothoraceque crebre fortiter rugulosis, in hoc rugulis transversim positis; elytris antice fortiter rugulose, postice paullo minus fortiter minus rugulose, punctulatis, ad apicem emarginatis. Long., $5\frac{1}{2}$ l.; lat., 1 l.

Very distinct from *B. filiformis*, Pasc., by the markings on its elytra and the emarginate apex of the same; also by its prothorax scarcely so elongate, not in the least narrowed in front, and with the rugulosity of its surface having a distincly transverse arrangement.

Victoria; taken by C. French, Esq., from a wattle near Lillydale.

MAULIA (gen. nov.).

Caput sat breve, genis antice dentiformibus, fronte lata minus concava; oculi sat tenuiter granulati, lobo superiori sat parvo; tuberculi antennarii subobsoleti; antennæ robustæ, sat breves; prothorax supra sat inæqualis, ad latera tuberculatus; elytra sat parallela abdomen tegentia; pedes minus elongati, femoribus leviter clavatis, tarsis sat latis; coxæ anticæ globosæ minus approximatæ, postice apertæ; coxæ intermediæ ad latera clausæ; segmentum ventrale basale quam cetera modice longius; unguiculi divaricati.

The intermediate trochantins are very conspicuous, transversly placed, and transversely intersected by a strong sulcus.

I am at a loss to suggest any group of Longicornes in which this genus can be placed satisfactorily.

The structure of the intermediate coxæ and parts adjacent thereto is decidedly suggestive of *Phalota*, but the facies and many characters are quite inconsistent with such an alliance. The general appearance is much like that of *Pempsamacra dispersa*, Newm., in miniature, with which there is agreement in many characters including the tooth-like prominence of the apex of the cheeks, but in *Pempsamacra* the intermediate coxæ are widely open laterally. *Nenenia*, Pasc., is a genus which its author has been unable to place in any named "tribe," though considering it nearest to *Phalota*, and these particulars seem to suggest a probable relationship to the present insect; I think I know *Nenenia*, and in that case there does not seem to be much real affinity, but even if I am wrong in my identification the "fronte excavato" and "abdominis segmenta longitudine æqualia," of that species are quite conclusive as to its generic distinctness from that which I have characterised above. On the whole I think this genus cannot stand far away from *Pempsamacra*.

Compared with *Pempsamacra dispersa* (and apart from size) the head of this insect is less produced in front, but is very similar in respect of its slight concavity and width between the antennæ, and in the structure of its antenuæ (except in the apical six joints being less abbreviated); its prothorax is considerably shorter, with much stronger and sharper lateral tubercles; and its elytra are scarcely so much narrowed hindward.

I believe I am right in considering that the intermediate coxæ are closed externally; it is very difficult, however, in the case of a small *Longicorn*, with the sternal sutures much obscured by rugulosity to be quite sure without the removal of the mesothoracic epimeron whether the angle of the metasternum absolutely touches that of the prothoracic episternum.

M. picticornis, sp. nov. Modice elongata; supra opaca, pilis erectis nonnullis sat sparsim vestita, obscure pupureo-brunnea, antennis flavo nigroque læte variegatis, elytrorum lateribus antice anguste flavis; subtus nitida nigra cupreo-purpureoque iridescens, femorum tibiarumque basi et tarsorum articulis ultimis 2 flavis; corpore supra confertim sat fortiter ruguloso; elytris (ad apicem truncatis) præter hanc sculpturam foveis magnis nec profundis (his ab apice ad basin gradatim minoribuset magis crebris) confuse ornatis; sternis sat rugulose punctulatis; abdomine sublævigato. Long., $4\frac{1}{2}$ l.; lat., $1\frac{1}{5}$ l.

The first, second, sixth, seventh, eighth, and eleventh joints of the antennæ are entirely black (with a slight coppery tone); the ninth and tenth are entirely yellow, the rest yellow in the basal half and black in the apical half. The basal joint is stout and subcylindric, as long as 2 and 3 together, 2 very short, 3-5 slightly increasing in length successively (5 as long as the basal joint), 6, 7, and 11 each about equal to 3, 8-10 each shorter. The antennæ set back would scarcely reach the apex of the elytra.

Victoria; taken near Berwick by C. French, Esq.; unique in that gentleman's collection.

ECTOSTICTA.

E. ornata, sp. nov. Setis erectis sparsim vestita; rufa, capite prothorace abdomineque nigris, antennis obscuris (articulis 1° 2° que totis et ceteris basi plus minusve late rufescentibus) elytris piceis (spatio communi basali rufo, fasciisque binis albis); antennis quam corpus paullo brevioribus articulo 3° quam 1^{us} manifeste quam 4^{us} multo quam 5^{us} vix longiori, 6°-11° gradatim brevioribus; capite prothoraceque fortiter sat crasse ruguloso; hoc quam latiori parum longiori; lateribus modice rotundatis postice vix sinuatis; elytris apice rotundatis, juxta scutellum utrinque gibbosis, inæqualiter punctulatis; oculis sat tenuiter granulatis. Long., 3 l.; lat., $\frac{4}{5}$ l.

Compared with *E. cleroides*, White, this is a smaller much more rufus insect. The base of the elytra is bright red all across, and this red patch extends backward, irregularly narrowing to about the middle of the elytra. From the lateral margin, a little behind the shoulder, a moderately narrow white fascia runs obliquely inward and (slightly) forward, but stops abruptly at the edge of the red patch. The space immediately in front of this fascia, and that between it and the hinder fascia, are the darkest part of the elytra. The hinder fascia is placed slightly behind the middle, is of the same width as the other fascia, and

runs from the margin inward and scarcely forward to the suture. There is a well-defined gibbosity on each elytron (near the scutellum) on and around which the puncturation is very sparse; the front part of the lateral half of the elytra is very coarsely and not very sparsely punctured, the puncturation becoming closer and less coarse toward the suture and becoming obsolete in about the apical two-fifths of the elytra. The legs are entirely red.

Victoria; near Berwick; taken by Mr. French, and also sent to me by Mr. Sloane.

PHYTOPHAGA.

MEGAMERUS.

M. mandibularis, sp. nov. Mas. Sat elongatus; supra nitidus, subtus cum pedibus tenue pubescens; brunneus, mandibulis atris valde compresso-dilatatis et contortis; capite crebre ruguloso; prothorace leviter sparsius nec subtiliter punctulato; elytris inæqualiter punctulato-rugulosis et fortiter transversim rugatis; segmento ventrali apicali fovea profunda impresso. Long., 9 l.; lat., $3\frac{1}{5}$ l.

A considerably more elongate, less massive, species than *M. Kingi*, Macl., and of different colour, being of a full brown tone. The mandibles (perhaps of the male only) are very peculiar, being enormously compressed, dilated, and bent in their apical half; it is difficult to imagine how they can be serviceable. The antennæ scarcely differ from those of *M. Kingi* of the same sex. Compared with *M. Kingi* the head is rugulose and very much more closely sculptured; the prothorax is narrower, much more distinctly punctured, and with its hind angles not at all prominent laterally; the elytra are much more strongly and unevenly sculptured, and are transversely wrinkled; the impression on the apical ventral segment is very much deeper.

N. W. Australia; in the collection of C. French, Esq.

HISPIDÆ.

EURISPA.

E. nigripes, sp. nov. Sat angusta; æneo-nigra, prothorace rufotestaceo linea mediana rufa notato ad latera sat late niveomarginato, elytris pallide luteis (horum apice summo nigro) margine externo anguste albido; antennis sat brevibus, articulis 2 et 3 sat elongatis, 4-6 brevioribus nec transversis cylindricis, 7-10 transversis, 11 acuminato; prothorace quam transbasin latiori parum longiori, antice angustato, minus crasse vix rugulose punctulato; elytris apicem versus acuminatis breviter spiniformibus, striatis, striis foveis sat

magnis seriatim impressis, interstitiis postice vix convexis; abdomine (præsertim antice) sat crebre transversim rugato. Long., $2\frac{1}{2}$—3 l.; lat., $\frac{3}{5}$—$\frac{7}{10}$ l.

Mare magis angusto sat parallelo, segmento ventrali apicali postice emarginato.

Femina pone medium manifeste dilatata; abdomine opaco coriaceo; segmento ventrali apicali carina transversa recta instructo.

Near *E. albipennis*, Germ. (which I have never been able to identify), and possibly a colour-var. of that species on the supposition of a slight mistake in Germar's description, according to which the sixth joint of the antennæ is transverse and wider than the fifth, whereas in the examples before me that joint is not transverse, and not at all wider than the fifth (the seventh being the first wider joint). *E. albipennis* is also said to have its front femora ferruginous at the base, and no mention is made of the snowy-white sides of the prothorax. Among the somewhat numerous examples I have seen of the species I am describing I have seen no ferruginous colouring on the femora, and very few specimens in which the lateral vittæ of the prothorax are not well defined. Compared with *E. Howitti*, Baly, this species apart from colour, *inter alia*, has the prothorax not nearly so coarsely and rugulosely punctured, the apical five joints of the antennæ much shorter, and the elytra a little less strongly produced behind into a tail.

S. Australia; Port Lincoln district.

E. simplex, sp. nov. Sat angusta; fere ut præcedens colorata sed elytrorum apice summo haud nigro; a præcedenti differt prothorace antice haud angustato multo magis crasse magis rugulose punctulato; elytris ad apicem multo minus acuminatis. Long., $2\frac{1}{2}$—3 l.; lat., $\frac{3}{5}$—$\frac{7}{10}$ l.

Near *E. Howitti*, Baly, but at once distinguishable by its elytra very much less drawn out at the apex and its antennæ much shorter, with joints 7-10 transverse and much shorter, and its legs entirely black.

Victoria; Alpine district.

E. fraterna, sp. nov. Sat angusta; nigra, pedibus antennarumque parte mediana rufescentibus, prothorace (hoc rufo-trilineato) elytrisque fulvo-testaceis; antennis subelongatis, articulo 1° brevi fere transverso, ceteris quam latioribus plus minusve longioribus; prothorace quam latiori paullo longiori, antice parum angustato, postice subtruncato, minus crasse vix rugulose punctulato; elytris apicem versus acuminatis fortiter productis breviter spiniformibus, striatis, striis foveis sat magnis seriatim impressis, interstitiis angustis postice subcarinatis. Long., 3 l.; lat., $\frac{3}{5}$ l.

Very close to *E. major*, Blackb.; differing from it by its smaller size, colouring, less coarse prothoracic puncturation, elytral interstices scarcely convex anteriorly, and especially by the almost truncate base of its prothorax; from *E. Howitti*, Baly, it differs by the narrower interstices of the elytral striæ and the much more elongate prothorax which by measurement is considerably longer than its greatest width; from *E. normalis*, Baly, by the anteriorly non-costate interstices of its elytra and its prothorax considerably narrower across the front than across the base; the other described species have the subapical joints of the antennæ much shorter.

N. Territory of S. Australia.

LONGICORNES.

MICROTRAGUS.

M. sticticus, Pasc. The author of this species was unable to state its habitat, and in Masters' Cat. nothing more precise than "Australia" is mentioned. It is worthy of note therefore that I have lately received a specimen taken by Mr. C. T. Musson, F.L.S., at Narrabri, N. S. W.

COCCINELLIDÆ.

SCYMNODES (*Blackb.*, Tr. Roy. Soc., 1888, p. 189).

S. Koebeli, sp. nov. Sat late ovalis; sat convexus; pilis albidis erectis sat dense vestitus; nitidus; sat crebre sat fortiter punctulatus; æneo-niger capite antennis pedibus anticis femoribus intermediis basi tarsis omnibus elytris ad apicem abdomineque rufis; prothorace quam longiori plus quam duplo latiori, elytris basi angustiori, antice leviter angustato, lateribus pone medium fere rectis, angulis anticis prominulis rotundatis, posticis distinctis fere rectis. Long., $1\frac{3}{5}$ l.; lat., $1\frac{1}{5}$ l.

N. S. W.; Gosford; taken by Mr. Koebele.

SCYMNUS.

S. tenebricosus, Bohem. I have lately received from Mr. Koebele an example taken near Sydney, which appears to be this insect, agreeing very well with the description. Mr. Koebele has also given me some examples taken at Mulgoa (N. S. W.), which I judge to be conspecific, although they are considerably larger, and seem a little more minutely punctured; in one of them, moreover, the intermediate (as well as the front) tibiæ are testaceous, and in all of them the prothorax is narrowly rufescent along its front margin. This latter character would perhaps suggest a doubt as to whether my identification is correct, but in

some specimens the rufescence "needs looking for," and would easily escape the notice of a describer who had not seen specimens having it more defined.

RHIZOBIUS.

R. fugax, sp. nov. Ovalis; sat elongatus; modice convexus; pilis pallidis suberectis sat dense vestitus; sat nitidus; subfortiter vix crebre (elytris mediis suturam versus sparsim minus fortiter) punctulatus, ferrugineus (elytris, prothoracis parte postica mediana, femoribusque apicem versus, piceis exceptis); prothorace quam longiori duplo latiori, antice minus angustato, elytris basi vix angustiori, lateribus parum arcuatis, angulis anticis rotundatis nullo modo productis, posticis fere rectis. Long., $1\frac{4}{5}$ l.; lat., $1\frac{1}{5}$ l.

The prosternal ridge is narrowed forward, but is not sharply pointed at the apex. This character in combination with the presence of erect hairs on the elytra, finer and longer than the general pubescence brings the present insect near *R. Lindi*, Blackb., from which it differs *inter alia* by its more elongate form and very much coarser puncturation. The puncturation is not unlike that of *R. Evansi*, Muls., but is distinctly less close, and near the suture of the elytra finer. Were it not for this latter character I should regard it as possibly a variety of *Evansi*.

N. S. Wales; taken by Mr. Koebele near Whitton.

R. dorsalis, sp. nov. Sat late ovalis; sat convexus; pilis albidis erectis sat dense (nonnullis multo longioribus intermixtis) vestitus; nitidus; supra piceus, prothoracis lateribus et elytrorum regione suturali indeterminate rufescentibus; subtus rufescens, antennis palpis pedibusque rufo-testaceis, femoribus (præsertim posticis) infuscatis; capite prothoraceque subcrebre minus fortiter, elytris magis fortiter nec profunde minus crebre, punctulatis; prothorace quam longiori plus quam duplo latiori, antice minus angustato, elytris basi vix angustiori, lateribus leviter arcuatis, angulis anticis obtusis (certo adspectu rotundatis) posticis rectis. Long., $1\frac{1}{5}$ l.; lat., $\frac{9}{10}$ l.

A small inconspicuous species, chiefly notable superficially for the distinct (but not sharply defined) reddening of the sutural region, which seems to be constant. The flattened surface of the prosternal ridge is triangular, and very sharp in front. The puncturation is strong on the elytra, but considerably less fine on the prothorax.

N. S. Wales; Gosford; taken by Mr. Koebele.

R. cæcus, sp. nov. Ovalis; convexus; pilis argenteis suberectis sat dense vestitus; sat nitidus; subtilissime sat crebre punctulatus; totus ferrugineo-rufus; prothorace quam longiori vix duplo latiori, elytris basi angustiori, antice parum angustato, lateribus fere rectis, angulis anticis rotundatis haud prominulis, posticis fere rectis. Long., 1 l.; lat., $\frac{7}{10}$ l. (vix).

The silvery pubescence of the upper surface is mingled with fine hairs longer and more erect than the rest. The prosternal ridge is sharply pointed in front, but owing to the strong convexity of the prosternum (of which it forms the flattened median surface) it is less noticeable than in most of the *Rhizobii*, and requires to be looked at from a particular point of view (obliquely from the side) to be seen distinctly; the carinæ limiting the ridge are excessively fine. The prothorax covers the eyes more completely than in most *Rhizobii*, but owing to the thin substance of the former the eyes can be seen through it. It may be distinguished from its Australian congeners, having mixed pubescence and a prosternal ridge sharp in front, by its uniform rufous colour.

N. S. W.; taken by Mr. Koebele at Gosford.

R. lanosus, sp. nov. Sat late ovalis; sat convexus; nitidus; supra pilis erectis ochraceis confertissime vestitus; piceo-niger, haud ænescens, tarsis rufescentibus, antennis palpis abdomineque rufo-testaceis; capite prothoraceque sat crebre subfortiter, elytris fortiter paullo minus crebre, punctulatis; prothorace quam longiori plus quam duplo (postice quam antice haud multo) latiori, lateribus fere rectis, angulis anticis rotundatis vix prominulis, posticis fere rectis. Long., 2 l.; lat., $1\frac{1}{2}$ l.

This species is readily characterised by its non-metallic surface, together with its dense even clothing of erect ochraceous (not silvery or whitish) pile. The flattened surface of the prosternal ridge is very wide (not at all pointed) in front. In my tabulation of *Rhizobius* (Tr. Roy. Soc. S. A., XI., pp. 203-4) the present insect would require the formation of a distinct subsection (line 2, p. 204) as follows:—" B.B.B. Elytra very densely and evenly clothed with erect pubescence."

Queensland; Toowoomba; taken by Mr. Koebele.

R. pulcher, sp. nov. Ovalis; convexus; pilis albido-argenteis brevibus sat dense vestitus; supra testaceus capite et maculis nonnullis in elytris positis infuscatis; subtus piceus abdominis lateribus et apice plus minusve testaceis; pedibus sordide testaceis, femoribus plus minusve infuscatis; capite prothoraceque obscure subtilissime, elytris distincte vix

crebre, punctulatis ; prothorace quam longiori circiter duplo latiori, antice parum angustato, elytris basi haud angustiori, lateribus vix arcuatis, angulis anticis sat rotundatis, posticis rectis ; prosterno æqualiter convexo, antice simplici. Long., $\frac{9}{10}$ l. ; lat., $\frac{3}{5}$ l.

A prettily-marked little species ; the general colour of the upper surface varies a little, the dark markings being less conspicuous on the examples having the ground colour less pallid. The markings are as follows:—A small spot on each side of the scutellum, the suture (where the infuscation is dilated into a large common spot about the middle), and an oblong vitta-like dash on either side near the lateral margins, which in some examples is dilated at its apex, and connected near its front with the median dilatation of the suture. Allied to *R. umbratus*, Blackb., but differently marked, with the front angles of the prothorax not at all prominent, &c. ; in *R. umbratus* these angles, though not sharp, are slightly prominent.

N. S. Wales ; taken by Mr. Koebele near Mulgoa.

BUCOLUS.

B. convexus, sp. nov. Sat late ovalis ; sat convexus; sat nitidus; supra pilis argenteis sat crebre vestitus ; nigro-piceus, prothorace abdomine tarsisque rufis ; capite planato, crebre subfortiter punctulato ; prothorace quam longiori circiter duplo latiori, crebre subtilius punctulato, antice angustato, ad latera valde deflexo ; elytris crebre fortius punctulatis. Long., $1\frac{3}{5}$ l. ; lat., $1\frac{1}{5}$ l. (vix).

Considerably less wide and depressed than *B. Fourneti*, Muls., but agreeing with that species in structure, the prosternum being prolonged to receive the head in repose, the tibiæ being very strongly dentate externally, and the epipleuræ having very well-defined foveæ.

N. S. W. ; taken by Mr. Koebele near Sydney.

LIPERNES.

Blackb., Tr. R. Soc., S.A., XI., p. 211.

L. subviridis, sp. nov. Late ovalis ; sat convevus ; nitidus ; piceo-niger, supra obscure subviridi-micans; subtiliter sat crebre punctulatus. Long., $\frac{9}{10}$ l. ; lat., $\frac{7}{10}$ l. (vix).

Differs from *L. angulatus*, Blackb., in its smaller size, æneous tone of colour, base of prothorax not angular in front of the scutellum, and in the closer puncturation of its elytra, which is uniform with that of the prothorax.

N. S. W. ; taken by Mr. Koebele at Gosford.

SERANGIUM.

Blackb., Tr. R. Soc., S.A., XI., p. 209.

S. maculigerum, sp. nov. Late ovale; convexum; nitidum; capillis erectis sparsim vestitum; nigrum, antennis palpis corpore subtus pedibusque plus minus dilutioribus, elytris utrinque macula magna discoidali rufa ornatis; supra sublævigatum; subtus punctulatum. Long., $\frac{7}{10}$ l.; lat., $\frac{3}{5}$ l.

The red spot on each elytron is at about half the length, but is nearer to the suture than to the external margin. Notwithstanding its great difference in size, I cannot find any reason to separate this species generically from *S. mysticum*.

Queensland; taken near Toowoomba by Mr. Koebele.

S. hirtuosum, sp. nov. Sat late ovale; convexum; nitidum; capillis albidis sat elongatis erectis sat dense vestitum; obscure rufum hic illic plus minusve distincte infuscatum, elytrorum sutura anguste nigra; supra leviter vix perspicue, subtus sat manifeste, punctulatum. Long., 1 l. (vix); lat., $\frac{7}{10}$ l.

This species is much like *S. mysticum*, Blackb., in miniature, but of a brighter red color, the head and prothorax scarcely infuscate, the pilosity more conspicuous, and some puncturation traceable on the upper surface.

N. S. Wales; taken near Sydney by Mr. Koebele.

TRICHORCUS (gen. nov. Coccinellidarum).

Ab *Orco* differt corpore haud metallico, subopaco, dense pubescenti.

I can find no structural character to distinguish the genus from *Orcus*, but it seems scarcely possible to place in that genus a non-metallic subopaque species densely clothed with pubescence.

T. cinctus, sp. nov. Hemisphæricus; dense fulvo-pubescens; subopacus; supra brunneus, prothorace nigricanti (basi excepta) albido-marginato, elytris externe testaceo-marginatis (margine a basi retrorsum gradatim dilatato); subtus nigricans, abdomine testaceo; confertim subfortiter punctulatus; clypeo antice late sat fortiter emarginato et ad latera ante oculos dilatato; prothorace antice profunde bisinuatim emarginato, ante basin linea transversa minus distincte impresso; antennis palpisque labialibus flavis, illis apicem versus infuscatis. Long., $1\frac{4}{5}$ l.; lat., 2 l.

This remarkable insect is actually a trifle wider than long. I have seen nothing at all near it.

N. S. Wales; taken near Sydney by Mr. Koebele.

The Energy of the Electromagnetic Field.

By Professor W. H. Bragg, M.A.

[Read May 3, 1892.]

In an address given to Section A of the Australasian Association for the Advancement of Science, at the Hobart meeting, in January of this year, I showed that an exact analogue of the electromagnetic field due to currents and magnets existed in the case of membranes displaced by uniform pressures or to fixed amounts in an infinite elastic medium; a medium in which, if any element be displaced, there is a force of restitution proportional to the volume of the element and the amount of its displacement.

It is interesting to start with the supposition of the existence of such a medium, and hence develop the theorems which we know to be true of the energy of the field. They follow very simply from this hypothesis.

Suppose a thin membrane in such a medium as I have described above. A uniform pressure per unit area will cause displacement, supposed small. Let the uniform pressure be $4\pi C$, and the total displacement of the membrane, *i.e.*, the volume it moves through, be $\frac{LC}{4\pi}$. Then C corresponds to the current running round a circuit represented by the edge of the membrane, and causing a total induction through its contour equal to LC. The energy so stored up in the elastic medium is $\frac{1}{2}$ × force × displacement, *i.e.*, $\frac{1}{2} LC^2$.

Now, in the medium so disturbed, let a second membrane be placed, and acted on by a uniform pressure, gradually increasing to $4\pi C'$. The medium, although already strained, will make *exactly the same opposition* to the new straining force as if it were unstrained, because from the nature of the medium the force resulting from a new displacement of any small volume already displaced is independent of the previous displacement. So the second membrane will be displaced just the same as if it were the only one, and the work done in displacing it will be $\frac{1}{2} L'C'^2$ (say).

But—and this is the point—whilst this second membrane has been undergoing displacement, so has the first; and the amount of displacement of the first is of course proportional to C', say $\frac{MC'}{4\pi}$. So $\frac{M}{16\pi^2}$ is the amount of displacement through the first

circuit due to unit pressure on the second. Thus during the displacement of the second membrane the pressure, $4\pi C$, on the first does a fresh amount of work, $\frac{MC'}{4\pi}.4\pi C$, *i.e.*, MCC'. Thus the total energy of the field is

$$\tfrac{1}{2} LC^2 + MCC' + \tfrac{1}{2} L'C'^2,$$

which is the well-known important theorem.

This can be extended to cases in which there are any number of circuits, by taking the corresponding membranes one by one.

It is evident from the symmetry of this equation that the displacement of any membrane B caused by unit pressure acting on a membrane A is equal to the displacement of A caused by unit pressure on B.

We may employ this last principle to find the displacement at any point due to a membrane under uniform pressure, corresponding to a closed circuit. Suppose we require the displacement at a point P in the direction x. Let A be a very small area placed at P perpendicular to x. Then the displacement of A due to unit pressure on the membrane is equal to the displacement of the membrane due to unit pressure on a small membrane coinciding with A.

Suppose a number of membranes placed at regular distances behind A, all perpendicular to x and equal to A; let there be n of them per unit length, and let the series reach to a point B very far from A. Let unit pressure act on each of these. Then the matter in which the membranes are imbedded will be displaced like a solid cylinder, and if d be the displacement of each, $\frac{4\pi}{\mu}$ the elasticity of the medium.

$$A\,n = \frac{4\pi}{\mu} d\,A$$

$$\therefore \quad d = \frac{\mu n}{4\pi}$$

The effect of the displaced cylinder will be the same as if at A there were a total displacement, $\frac{A\,\mu\,n}{4\,\pi}$ spreading out uniformly in all directions, and at B a corresponding inwards displacement. The lines of displacement from A will therefore be practically straight lines; and the amount of displacement of the original membrane is $A\,\mu\,n\,\frac{\Omega}{16\pi^2}$ where Ω is the solid angle subtended by it at A.

The displacement of the original membrane due to the pressure on A is equal to the difference between $A\,\mu\,n\,\frac{\Omega}{16\pi^2}$ and $\frac{A\,\mu\,n}{16\pi^2}$

$\left(\Omega - \frac{d\,\Omega}{d\,x}\,\frac{1}{n}\right)$: for the latter quantity is the displacement of the membrane due to the cylinder with the small membrane A removed, or which is the same thing, the original cylinder pushed back a distance $\frac{1}{n}$

Thus the displacement through A due to unit pressure on the original membrane $= \frac{A\,\mu}{16\pi^2}\,\frac{d\,\Omega}{d\,x}$

Thus displacement *at* A $= \frac{\mu}{16\pi^2}\,\frac{d\,\Omega}{d\,x}$ due to unit pressure on membrane.

Hence displacement at A in the direction n due to pressure $4\,\pi\,C$ on membrane $= \frac{\mu\,C}{4\,\pi}\cdot\frac{d\,\Omega}{d\,x}$

Further, if P is the pressure at A this displacement

$$= \frac{\mu}{4\pi}\,\frac{d}{d\,x}\,\frac{P}{x}$$

$$\therefore\ P = C\,\Omega + \text{constant.}$$

In this analogy P, of course, corresponds to magnetomotive force.

The Phaneropteridæ of Australia and Polynesia.

By J. G. O. Tepper, F.L.S.

[Read May 3, 1892].

INTRODUCTION.

The Phaneropteridæ of the tribe Locustodea in the Orde of the Orthoptera or Straight-winged insects are scattered over all continents in a limited number of genera and species, but seldom, if ever, occur in such numbers as to become destructive, although all are herbivorous. Many kinds are rare and very rare, being perhaps restricted to small areas by the presence or absence of particular food-plants, certain other insects, peculiarities of soil and climate, &c.

The family is, however, on this account very interesting to the entomologist, and also on that of their peculiar structure, notably the long slender limbs, angular or otherwise peculiarly-shaped pronotum, regular venation of the anterior pair of wings, usually called elytra (or tegmina) which afford good generic or specific distinctions, and the usually short, curved, serrated ovipositor of the females.

Of the habits of the Australian species, and perhaps of most of the others, little appears to be known; the solitary life of the widely scattered individuals rendering the elucidation of their life-history very difficult.

The chief and most recent authoritative monographer of the Phaneropteridæ is Brunner van Wattenroyl, and since the publication of the "Addimenta," 1891, to his excellent "Monographie der Phaneropteriden" (Wien, 1878), no general work appears to have been issued, nor any Australian species described.

In the following pages is presented a concise record of the Australian representatives of the family as far as that is possible under the circumstances. Genera and species, however, not represented in the S. A. Museum will only be recorded, with Brunner's synoptical descriptions in English, while full descriptions will be given of the others from the specimens at disposal and such information about habits and distribution attached as is warranted by the author's observations and experience.

The colour of living specimens is some shade or tint of green in most genera, but is easily bleached by exposure to sunlight as with preserved specimens, and wholly extracted

through immersion in alcohol, which changes the green into a pale brownish-yellow. Colour is, therefore, a most unreliable character to any one not familiar with the living insects, although it may be perfectly constant for some species, or variable with others; the latter is, however, comparatively rare with indigenous forms. Killing with chloroform is apt to convert the fuscous tints into more or less bright ferruginous shades. Some species, again, are naturally of a testaceous colour, especially those living among the dry grass during the latter part of the very warm and dry summer, acting as a protective gift at a time when scarcity of insect-life causes a keen search by insectivorous birds.

One of the causes that so comparatively few of the Phaneropters find their way into collections is that they are extremely brittle and delicate when dry, so that they are very apt to arrive in a hopelessly fragmentary condition, and impossible to restore to respectable appearance, or for safe determination.

Brunner's types have been inaccessible, but his descriptions and figures are so clear, that the chance of misinterpretation does not appear to be very great. The new descriptions have been drawn up on the same plan of Brunner's, and, I hope, will recommend themselves to your judgment. In several instances the original descriptions have been slightly departed from, or extended by adding some distinctive characters from the specimens before me, preferring to extend the genus or species rather than to form new ones.

The abbreviation "Br. Mon.," followed by figures, refers to Brunner's "Monographie der Phaneropteriden," Wien, 1878, pp. 1-401, published by the K. K. Zool. and Botan. Society of Vienna in their Transactions, which has been followed throughout, and "Br. Mon. Add." to his "Addimenta" to the same in 1891 by the same Society (vol. XLI., part 1., pp. 1-196).

SYSTEMATIC DESCRIPTION.

Tribe Locustodea.

Tarsi depressed. Fore tibiæ provided with foramina.

This tribe is divided by Brunner into 14 families, of which the following is the first in order:—

FAMILY PHANEROPTERIDÆ.

First and second joint of tarsi laterally rounded. Prosternum without appendages. Hind tibiæ above with an apical spine on both sides, below with two spines on each side.

The family is subdivided into 43 groups, with 164 genera, most of which are illustrated by Brunner by a full figure or details of

one species. I add, here, another, making the total 165. The former number embraces 685 species described by Brunner, of which 100 inhabit Europe, 150 Asia and the Malayan Archipelago, 95 Africa and its islands, 52 North and Central America, 240 South America and West India, 38 Australia, and 16 New Guinea and Polynesia. Of 10 species the habitat was not known, and 15 species, including 3 Australian, inhabit two continents (one species being found in three). Twelve species are, herein, added to the above (all Australian), which raise the total for Australia to 50, and the grand total to 697 species. In the following enumeration the New Guinea, Polynesian and some other species have been included, the former on account of their geographic proximity, and the latter because so closely related to the Australian forms, that their omission might have impaired the completeness of the record.

The following characters are employed by Brunner, and have been adopted by me as leading ones, viz.:—

1. The presence of a spine at the coxæ (or hip-joints) of the fore tibiæ.
2. The form and armature of the fore tibiæ on the upper side.
3. The form of the foramina (open, shell-like, or cleft-like) or assumed auditory organs of the fore tibiæ.
4. The character of the venation of the elytra.
5. The presence and form of the crenulations or dentations at the apex of the ovipositor of the females.
6. The presence and form of the articulately-inserted styles of the subgenital lamina of the males.

These prove very efficient in limiting and defining the groups and genera, while Walker's descriptions in the British Museum Catalogue are, so far as the Locustodeæ are concerned, wholly inefficient for certain recognition, and therefore disregarded in modern classification, especially as he includes the Phaneropteridæ, Decticidæ, Gryllacridæ, &c., in one and the same family, of all of which he only mentions some 71 species altogether as Australian.

Considerable increase in the number of indigenous species may be expected in future, when those of the little explored tropical parts of this continent become better known and determined, for the warmest and warmer parts of the world are the principal home of the Phaneropteridæ. It is hoped that this paper may contribute somewhat to incite more vigorous researches.

A. Group DUCETIÆ (Br. Mon. 15, 108).

Anterior coxæ unarmed. Pronotum with a distinct humeral sinus. Elytra, and sometimes the wings, perfectly explicate. Vertex flat or inclined, somewhat elongated, forming a distinct

angle with the frontal fastigium. Subgenital lamina of male without free styles, but deeply cleft. Old World species. There are two genera, one with four, the other with two species.

Genus Ducetia, *Stäl.* (ibid).

Foramina open on both sides, somewhat narrowed. Fore tibiæ sulcate and spinulose above, appearing as if divided laterally at the base. Femora spined below.

Ducetia Japonica, *Thunberg* (ibid, fig. 16).

Elytra somewhat acuminate. Radial and ulnar areas with few venules. Fore margin of wings almost straight, with triangular area near apex.

	Male.	Female.
Length of body	16 mm.	20 mm.
Length of pronotum ...	4 "	4·5 "
Length of elytra ...	26 "	28 "
Width of elytra... ...	5·5 "	5 "
Length of hind femora...	22 "	22 "
Length of ovipositor ...	— "	6 "

Habitat.—Queensland, India, Ceylon, Philippine Is., Japan.

B. Group ACRIDOPEZÆ (Br. Mon. 1, 139).

Vertex very much inclined, elongate, fastigium not forming any angle with the front, or scarcely conspicuous, laminately and horizontally produced. Pronotum short, embracing the head. Palpi slender. Femora slender all round.

Genus Acridopeza, *Guérin* (ibid).

Elytra of the male rather large, of the female short and very much arched; latter without wings. Male without free styles. Ovipositor of female extremely short, valves free, smooth. Monotypic.

Acridopeza reticulata, *Guérin* (ibid, fig. 33).

Brownish. Head paler, spotted with blackish. Antennæ black, with narrow pale-testaceous bands. Elytra of male brownish, marbled, paler and darker, the veins partly blackish; those of the female with one larger and one or two smaller black spots, also the portion of the right elytron, covered at rest by the left, which is deep shining-black. Legs (except base of tibiæ and the tarsi, which are black) testaceous, banded with black. Abdomen black, the covered parts of the segments, also the whole underside of the female, bright crimson, posterior margins with bright blue guttæ, the blue fading after death; of the male the same parts of segments, brownish-testaceous, the guttæ whitish.

	Male.		Female.	
Length of body ...	20–25	mm.	22–27	mm.
Length of pronotum ...	5	"	5– 6	"
Length of elytra ...	35–42	"	18–20	"
Width beyond base ...	6– 9	"	9–12	"
Width before apex ...	10–13	"	9–12	"
Length of hind femora	21–24	"	16–20	"
Length of ovipositor ...	—		1·8	"

This peculiar insect appears to be very local in its distribution. The males are usually found on the trunks and thick lower branches of Eucalypts *(E. obliqua)*, or the stems of Eucalyptus-shrubs where trees are absent, and in hot sunshine take readily to their wings, but in cooler weather are rather sluggish. The females are also found in similar situations, but more frequently nearer (or on) the ground, among tufts of grass, sedges, or small shrubs. Their movements are slow, and when suddenly approached or alarmed, rise as high as possible on their legs and raise the elytra, at the same time extending the abdomen, thus exposing the brilliant colouring, which, no doubt, serves to ensure their safety from attack by birds, lizards, &c., as denoting inedibility, for they make no attempt to fly or escape. When taken by the hand, a copious brownish fluid is exuded from the mouth, which stains the parts touched,

Habitat.—All the specimens in the Adelaide Museum are from the Mount Lofty Ranges, where they are (or were) by no means rare in some of the gullies watered by a rivulet, occuring there from January to March. In October, 1861, the author observed and captured some at Bundaleer, where they frequented small scattered clumps of stunted Eucalypts. They also are found in Victoria, New South Wales, Queensland, and North Australia.

C. Group APHIDNIÆ (Br. Mon. 19, 146).

Anterior coxæ spined. Frontal fastigium not produced. Vertex produced in the form of a pointed horn or crest-like tooth, much elevated above the fastigium.

Genus Machima, *Brunner* (ibid, 149).

Hind femora and tibiæ with long spines, or leaf-like dilated. Genera and species of this group are chiefly American.

Machima phyllacantha, *Burmeister* (ibid, 150, fig. 39).

Vertex with a short spine. Pronotum unarmed. Colour green, marbled with brownish and with white lines.

	Male.		Female.	
Length of body	20	mm.	25	mm.
Length of pronotum ...	5	"	6·5	"
Length of elytra ...	33	"	35	"
Width of elytra... ...	7	"	8	"
Length of hind femora ...	20	"	24	"

Habitat.—New Holland (*Serville*); Brazil (*Burmeister*, Geneva Museum). Serville's location of this species is possibly a mistake; it may, however, occur in some of the Pacific Islands, whence specimens may have found their way into the hands of Australian collectors, and through them reached the great French entomologist. The doubt requires to be cleared up, hence the species is inserted here.

D. Group PSYRÆ (Br. Mon. 19, 158).

Vertex flat or tumid, not spined. Fore tibiæ with conchate foramina in front and open ones behind. Elytra mostly of leathery texture and more or less subhyaline, radial veins contiguous, transverse veinlets much raised. Ovipositor longer, or as long as the pronotum, compressed, slender, gradually incurved, apex gradually acuminate, at the base roundly tumescent, margins crenulate or serrulate towards the tip, or rarely unarmed. Subgenital lamina with or without free styles.

The group is chiefly of Asiatic habitat, a few genera belonging to Africa, some species to the Sunda Islands, and one to New Guinea.

Genus Casigneta, *Brunner* (Mon. 19, 163; fig. 46).

Fastigium of vertex contiguous in a line with the frontal.

Disk of pronotum subrotundate, deflexed lobes, roundly inserted. Mesosternal lobes triangular, metasternal rounded. Fore tibiæ slender, doubly as long as pronotum, sulcate above, and distantly spined.

Casigneta lamellosa, *Brunner* (Mon. Add. 77).

Cerci (male) very long, scarcely incurved, apex claw-like. Subgenital lamina compressed, longer than pronotum, base divided in two widely-gaping lamella contiguous from the middle, acuminate,

	Male.	
Length of body	22	mm.
Length of elytra	38	"
Width of elytra	7	"
Length of pronotum...	5	"
Length of hind femora	24·5	"

Habitat.—Celebes.

Genus Phaula, *Brunner* (Mon. 20, 167; fig. 48).

Shiningly-smooth. Fastigium of vertex depressed, frontal acuminate. Pronotum with disk rotundate, and deflexed lobes roundly inserted. Elytra linear, margins parallel, branches of veins straight, mediastinal scarcely visible, first radial branch

oblique, simple, or with three branchlets, of which the first is branched and terminating in the hindmargin, transverse veinlets irregular. Fore tibiæ terete above and spined, or subsulcate and unarmed. Ovipositor shining.

The genus occurs in Borneo, the Philippine Islands, Java, Sumatra, Singapore, Africa, &c., one species extending to New Guinea.

PHAULA PEREGRINA, *Br.* (Mon. Add. 84).

Disk of pronotum flat, rather concave, with the deflexed lobes obtuse-angularly inserted. Size small. Subgenital lamina (male) short, obtuse triangular.

	Male.
Length of body	20 mm.
Length of pronotum ...	5 "
Length of elytra	32 "
Width of elytra	7·5 "
Length of hind femora ...	20 "

Habitat.—New Guinea, Waihou Islands.

PHAULA DENTICAUDA, *Brunner* (ibid).

Size much larger.

Habitat.—Celebes.

E. GROUP EPHIPPITHYTÆ (Br. Mon. 21, 188).

Anterior coxæ armed with a spine. Vertex flat or tumid, not spined. Foramina of fore tibiæ on both sides open or rimate. Ridges of pronotum rounded or acute, but neither crested nor crenulate. Ovipositor very short and shiningly-smooth, valves free. Subgenital lamina of male in narrow lobes resembling produced styles, which are, however, absent, except in *Dictyota*, where free ones are present.

Almost wholly endemic and comprising seven genera.

Genus EPHIPPITHYTA, *Serville* (ibid, 188).

Pronotum constricted before the midde, saddle-shaped. Hind femora spined below throughout their whole length. Ovipositor as long or slightly longer than the cerci.

EPHIPPITHYTA TRIGINTIDUOGUTTATA, *Serville* (ibid, fig. 54).

Yellowish-green, shining. Face, deflected lobes of pronotum, meso- and meta-notum, and sometimes the first segments of the abdomen with creamy white stripes laterally. Occiput spotted with brown. Antennæ uniformly yellowish. Fore part of disk of pronotum and the posterior angles with short black stripes. Elytra green, subpellucid, veins and veinlets very prominent, radial vein and hindmargin marked with black angular spots

(about 32 in the figure, hence the specific name). All the femora and some of the tibiæ have the extremities black. Hind tibiæ with three brownish bands, which are sometimes obsolete.

	Male.	Female.
Length of body ...	32–36 mm.	31–35 mm.
Length of pronotum ...	6– 8 "	7– 8·5 "
Length of elytra ...	48–58 "	54–61 "
Width of elytra ...	10–13 "	10–14 "
Length of hind femora	27–33 "	32–37 "
Length of ovipositor...	— "	3·5–4 "

Habitat.—New Holland (*Serv.*), New South Wales, Queensland, North Australia *(Brun.)*.

Comparing the figure and descriptions of Brunner, usually very exact, with Prof. McCoy's (Prod. Zool. Vict., Dec. XII., plate 120 ; 1885) and the specimens in the Adelaide Museum it is apparent that both the latter represent the *same* species, and are distinct from the first, as shown by the detailed description below. Prof. McCoy's description takes no cognizance of the venation of the elytra, nor the difference in the contour of the wings. His figures are excellent, however.

EPHIPPITHYTA QUADRIGESIMAGUTTATA, *sp. nov.*

(*E. trigintiduogutta*, McCoy, Prod. Zool. Vict., 120).

Dull browinish-green, shining. Face, lateral lobes of pronotum, and sides of meso- and meta-thorax with milk-white stripes. Occiput blackish. Antennæ basal part green for two-fifths of entire length, remainder brown. Anterior part of pronotum and hind angles blackish to black, also the extremity of the shoulders of the elytra. Latter semipellucid, green, veins much raised, the costal field near apex blackish, and from about 38 to 45 more or less intensely black guttæ along the radial vein (9-11), the hindmargin (7-10), and the anterior branch of the ulnar vein (2-3). All the femora and tibiæ are more or less marked with black at the extremities, as are also the tips of the spines. The hind tibiæ have three broad blackish bands on the inner side, the terminal one extending to the tarsi.

	Male.	Female.
Length of body ...	21–24 mm.	28 mm.
Length of pronotum...	5– 7 "	5·5 "
Length of elytra ...	38–41 "	48 "
Width of elytra ...	7– 9 "	8–9 "
Length of hind femora	25–26 "	28 "
Length of ovipositor...	— "	3 "

Habitat.—Murray Scrub, Sandy Creek, South Australia; Victoria *(McCoy)*.

This species differs from *E. 32-guttata*, Serville, by the elytra being much more suddenly contracted beyond the middle; the colours of the marginal space, the greater number, disposition and intensity of the guttæ, the different curvature of the first radial branch and the colour of the antennæ. After death the body, legs, and parts of the elytra become more or less brown, and in alcohol the whole insect assumes a pale testaceous tint, except the dark spots.

The insect feeds on the Australian Cyprus Pine *(Callitris verrucosa)*, and is but seldom seen. The three specimens in the Adelaide Museum were obtained at Monarto and Sandy Creek. At the former locality the writer captured three specimens close-together on one tree in 1872.

Genus Ephippithytoidea, *gen. nov.*

Fastigium of vertex terete, not much depressed, sub-contiguous with the frontal. Face moderately long, much retracted, slightly sulcate laterally, carinate about the eyes. Pronotum saddle-shaped, constricted, disk rounded posteriorly. Deflexed lobes roundly-inserted in front and angular behind, and distinctly sulcate. Elytra narrow-linear, hindmargin concave, nearly of equal width throughout, apex rounded; radial veins contiguous for some distance beyond the first radial branch; the latter is emitted slightly before the middle and forked towards its extremity; anterior ulnar vein parallel with radial branch emitting four branchlets to hindmargin. Transverse veinlets much raised, numerous, oblique, and closely reticulate. Tympanal area small, veins very strong, and a speculum in both elytra of the male. Wings as long as the elytra, apex rotundate. Fore and middle femora near apex with a few small spines and distant short hairs, hind femora armed nearly to the base, knee-joints with long spinose lobes, basal part very much incrassated, apical part very slender. Fore tibiæ with rimato-conchate foramina on both sides, terete above, posterior margin spined. Meso- and meta-sternum with short broad lobes. Supra-anal lamina of males deflexed between the hairy cerci; latter stout, bilobed at apex. Subgenital lamina in two lobes very thick in the middle, styles not apparent. Female unknown.

This genus differs from all others by the subtriangular lobes of the pronotum, the latter being convex above, besides many other distinctions. In general appearance, however, it resembles *Ephippithyta* so much that a superficial observer may easily mistake it for a smaller variety.

Ephippithytoidea sparsa, *sp. nov.*

Dusky yellowish varied with grey and blackish dots, &c., shining. Face black, the labium, a long wedge-like stripe

in the middle, two small spots below the same, a short stripe on either side, the base of the antennæ, and the cheeks pale yellowish. Eyes prominent, globose, dark brown. Pronotum, fore and middle femora and tibiæ, also the hind femora near the base blackish above, with very numerous pale round dots; exterior of hind femora with two black lines contiguous with black bars beyond; knee-joints black, also both extremities of hind tibiæ and an intermediary band. Abdominal segments partly blackish banded. Elytra sub-pellucid, veins ochraceous, reticulating veinlets mostly whitish, except within some black spots along the radial and ulnar veins, of which there are about 12-14. Wings dusky.

	Male.
Length of body (male only) ...	25 mm.
Length of elytra	38 "
Width of elytra	5 "
Length of hind femora	19 "

Habitat.—Roebuck Bay, Western Australia *(Messrs. A. E. Krapton* and *Tepper, jun.).* A single specimen was captured in November, 1891.

Genus Alectoria, *Brunner* (female), (Mon. Add. 10, 95; fig. 15).
(Synonym, *Hectoria*, Tepper (male) (Trans. Roy. S. A., vol. XI.)

Pronotum deeply constricted before the middle and crested behind. Crest with short tumid base, hollow, open below where projecting beyond the base, laterally with five diverging curved veins ending in the inferior hindmargin; anterior margin of pronotum with a smaller spine and a larger on each side behind the anterior constriction in the male. Elytra rugulose, first radial branch emitted much behind the middle, simple. Subgenital lamina of male deeply and roundly emarginate. Ovipositor short, not longer than cerci.

Brunner's description of the genus is taken from the female, alone, mine *(loc. cit.)* from the male, the latter supplementing the former in various details. In Brunner's figure the crest is represented with subparallel concentric lines of veins, while in my specimens they appear as described above, the eyes are also much larger than shown by the figure. Further, the fastigium of the vertex is declining and not at all prominent. The antennæ have the tips black, and five very narrow blackish rings at equal distances, the last about the middle, from thence to the base they are absent and the colour uniformly pale-green. The elytra have the margins almost parallel, narrowing very slightly to the obliquely truncate apex, *not suddenly narrowed* beyond the middle. The tympanal area of the elytra of the male is ample in both, the transverse plicate vein in the left elytron is,

however, very much stouter than in the right. All these differences are probably sexual, some are certainly so.

ALECTORIA SUPERBA, Br. (female) (ibid) (*Hectoria Pontoni*, Tepper, male).

Olive (or yellowish) green. Crest of pronotum greenish-yellow with ferruginous and black crenulate margin. Elytra and legs marked with brownish spots and bands. All the tarsi of both sexes are brown.

	Male.	Female.	Female Nymph.
Length of body... ...	20 mm.	36 mm.	15 mm.
Length of pronotum ...	5 "	15 "	3 "
Length of elytra ...	45 "	58 "	11 "
Width of elytra near base	8 "	12 "	4·5 "
Width of elytra { beyond / middle }	7 "	9 "	3 "
Length of hind femora...	24 "	32 "	18 "
Length of ovipositor ...	— "	2 "	1 "

Habitat.—Peak Downs, Queensland *(Brunner)*; Beltana *(legit F. A. Ponton)*, Terowie *(legit J. M. Bagot)*, South Australia.

Genus CAEDICIA, *Stäl.* (Br. Mon. 21, 189).

Dorsal part of pronotum flat, lateral edges more or less angular. Hind femora unarmed, or only with spines beyond the middle. Elytra lanceolate or slightly dilated beyond the apex. Deflexed lobes of pronotum higher than long; hind margin of meso- and meta-sternum lobed, lobes as long as high. Breast very broad. Deflexed lobes highest in the middle, hind margin either rounded or straight. Marginal area of elytra irregularly veined. Hind femora very stout at the base. Fastigium of vertex acuminate, almost contiguous with the frontal.

Thus far the above characters are in common with the remaining genera of the group to a greater or lesser extent, the following are the distinctive ones of the genus:—Elytra gradually narrowed from the middle, the first radial branch forked at or somewhat before the middle.

The species are all Australian excepting two from tropical West Africa.

CAEDICIA PICTIPES, *Stäl.* (ibid, 90).

Shiningly-ferruginous, striped with black. Disk of pronotum black, lateral stripes yellow. *Legs banded with black.*

Length of body (male and female) ...	30–32 mm.
Length of pronotum	6 "
Length of elytra	40–42 "
Width of elytra	9 "
Length of hind femora	27–28 "
Length of ovipositor	2 "

Habitat.—Cape York, Queensland (*Stäl.*); Tongatabu (*Brunner*).

Caedicia marginata, *Brunner* (ibid, 191).

Ferruginous, varied with green. Legs green, not banded. Fore tibiæ sulcate and spined above along the external margin. Meso- and meta-sternal lobes triangular. Hind margin of elytra straight or slightly sinuous. Hind margin of pronotum and tympanal area bordered with black. Size large.

	Male.
Length of body	19 mm.
Length of pronotum	4·5 "
Length of elytra	35 "
Width of elytra	6 "
Length of hind femora	23 "
Length of ovipositor...	—

Habitat.—Murray Bridge, South Australia; Kangaroo Island (*Tepper*); New Holland (*Brunner*).

Brunner's description of the male agrees very well with the specimens in the Adelaide Museum, including females, and larvæ and nymphs of both sexes, which were obtained in January and March, 1884, by the author at the above localities respectively (also an adult male). The following characters are supplementary. The prothorax, legs and antennæ are wholly ferruginous, the abdomen purplish, the elytra pale ferruginous in front of the radial veins, the colour extending partly to the costal margin and also to the base and margin of the triangular ulnar area, the remaining spaces being pale green, the colours shading gradually into each other. The dark spotted borders are very narrow, and the knee-joints of the femora blackish or brown.

Caedicia concisa, *Brunner*, (ibid, 192).

Bright green. Pronotum and tympanal area not spotted. Anterior margin of elytra bordered with ferruginous, remainder bright-green, opaque; radial branch forked before the middle, transverse veinlets irregular.

	Male.
Length of body	23 mm.
Length of pronotum...	5·5 "
Length of elytra	29 "
Width of elytra	7·5 "
Length of hind femora	23 "

Habitat.—North Australia (*Brunner*).

Caedicia longipennis, *Brunner* (ibid, 192, fig. 55).

Elytra green, pellucid, radial branch forked beyond the middle, transverse veinlets parallel.

	Male.	Female.
Length of body ...	23 mm.	26 mm.
Length of pronotum ...	5 "	6·5 "
Length of elytra ...	40 "	42 "
Width of elytra ...	7 "	9 "
Length of hind femora	25 "	28 "
Length of ovipositor ...	— "	2 "

Habitat.—Sydney, New South Wales; Qeensland (*Brunner*).

Caedicia validа, *Walker* (McCoy, Prod. Zool. Vict., Dec. XII., t. 120).

Dull green. Abdomen and legs brownish-green; face, lobes of pronotum, femora exteriorly, and the tympanal area of female, whitish. Disk of pronotum subequally wide. First radial branch forked before the middle. Cerci of male straight Ovipositor of female much curved towards the apex.

	Male.	Female.
Length of body ...	25 mm.	27 mm.
Length of pronotum ...	6 "	6 "
Length of elytra ...	32 "	42 "
Width of elytra ...	9 "	10 "
Length of hind femora	17 "	23 "
Length of ovipositor ...	—	5 "

Habitat.—Melbourne, Victoria.

As neither the description, so far as given by Walker and McCoy, nor the excellent figures of the latter appear to agree with any of Brunner's species or those in the Adelaide Museum, this species (*Phaneroptera valida*, Walker and McCoy) is recorded here, although somewhat doubtfully, as some of the requisite characters (venation) are not included in the original descriptions. The figures of McCoy, however, plainly denote its position in this genus.

Caedicia longipennioides, *spec. nov.*

Size large. Olive-green, abdomen much duller. Disk of pronotum wider behind, lateral margins narrow, pale testaceous; deflexed lobes of pronotum wide behind the middle, lower margin slightly sinuate, posterior rounded. Elytra subpellucid, with irregular subparallel veinlets, which are distinct and darker than the inclosed membrane. First radial branch forked in the middle, with two, sometimes three, simple ones beyond. Cerci of male incurved, so that the tips touch or sometimes cross each other. Subgenital lamina neither very acute nor narrowed. Ovipositor of female about half the length of the disk of pronotum.

	Male.	Female.
Length of body	10 mm.	25–28 mm.
Length of pronotum ...	6·5 "	6·5–7 "
Length of elytra	37 "	40–45 "
Width of elytra	6·5 "	12 "
Length of hind femora ...	19 "	25 "
Length of ovipositor ...	— "	2·5–3 "

Habitat.—Vicinity of Adelaide, South Australia (2 fem.); Wentworth, New South Wales. Captured in January and February, feeding on shrubs of Bursaria.

The species differs from *C. longipennis* in the lobes of the pronotum being widest behind the middle; in the first radial branch being divided at or behind the middle, in the greater width of the elytra, and in the purplish colour of the abdomen. From *C. major* it is separated by the shorter body, &c. The insects are rare.

Caedicia septentrionalis, *Brunner* (Br. Mon., 139).

Olive green. Elytra scarcely longer than the hind femora. Tranverse veinlets irregular, first radial branch forked before the middle, first branchlet sometimes divided again.

	Male.	Female.
Length of body	24 mm.	29 mm.
Length of pronotum ...	5 "	6 "
Length of elytra ...	35 "	32–36 "
Width of elytra ...	8·5 "	9 "
Length of hind femora ...	24 "	24–27 "
Length of ovipositor ...	—	1·5 "

Habitat.—Rockhampton, Port Denison, Queensland (*Brunner*).

Caedicia major, *Brunner* (ibid).

Size large. Elytra rounded at the hind margin, very broad, extending considerably beyond the hind femora; first radial branch forked before the middle, the only succeeding one simple; transverse veinlets distant.

Length of body (female)	42 mm.
Length of pronotum	8 "
Length of elytra	50 "
Width of elytra	15 "
Length of hind femora	28 "
Length of ovipositor	2 "

Habitat.—Cape York, Queensland (*Brunner*),

Caedicia olivacea, *Brunner* (ibid).

Greenish-olive, lateral ridges of pronotum ferruginous. Fore tibiæ unarmed, except apical spine. Hind femora spined below.

Lobes of metasternum triangular. Radial branch forked before the middle.

Length of body (male and female) ...	23 mm.
Length of pronotum...	5–6 "
Length of elytra	32 "
Width of elytra	10 "
Length of hind femora	18 "
Length of ovipositor (female) ...	3 "

Habitat.—Sydney, New South Wales ; Port Denison, Rockhampton, Queensland ; Eastern Australia (*Brunner*).

CAEDICIA INERMIS, *Brunner* (Br. Mon., 194).

Greenish-yellow. Hind femora unarmed below. Lobes of metasternum rounded (also *C. scalaris*). First radial branch forked before the middle.

	Male	Female.
Length of body	18 mm.	22 mm.
Length of pronotum ...	4·8 "	5 "
Length of elytra	30 "	29 "
Width of elytra	8 "	9 "
Length of hind femora	17 "	17 "
Length of ovipositor ...	—	3 "

Habitat.—North Australia, Western Australia (*Brunner*).

CAEDICIA HALMATURINA, *spec. nov.*

Dusky yellowish-green. Disk of pronotum wider behind, deflexed lobes as long as high, broadest in the middle, lower margin semi-circular, angular ridges pale-testaceous. Elytra oblong oval, radial veins closely contiguous and quite straight, except near apex, the anterior one terminating in frontal margin; first radial branch curved near base, forked before the middle, succeeded by two faint simple ones. Tympanal area very small. Hindmargin with blackish dots. Posterior part of metanotum, foraminal part of fore tibiæ and the upper side of abdomen purplish-crimson, posterior part of segments much darker. Cerci straight, almost parallel. Ovipositor short and sharply curved.

	Female.
Length of body...	19 mm.
Length of pronotum	4·5 "
Length of elytra	25 "
Width of elytra	6·6 "
Length of hind femora...	15 "
Length of ovipositor	3 "

Habitat.—Kangaroo Island, where a specimen of a female was captured by the author on March 12, 1884, near Mount Tisbet.

The species approaches *C. inermis* in appearance, but differs in shorter broader elytra, spinose fore tibiæ, &c., and the purple colour of the abdomen and knees.

CAEDICIA SCALARIS. *Brunner* (ibid, 195).

Pale-green. Elytra with very distinct veins, first radial branch forked beyond the middle, and the transverse venules very regular and ladderlike.

	Male.
Length of body	21 mm.
Length of pronotum	5 "
Length of elytra	32 "
Width of elytra	8 "
Length of hind femora	18 "

Habitat.—Sydney, New South Wales (*Brunner*).

CAEDICIA MINOR *Brunner* (Br. Mon., 195).

Fore tibiæ terete above, spined along external margin. Hind-femora below armed with 8-10 spinelets along the posterior margin. Size small.

	Male.	Female.
Length of body... ...	20 mm.	22 mm.
Length of pronotum ...	4·2 "	4·8 "
Length of elytra ...	30 "	35 "
Width of elytra ...	6 "	7 "
Length of hind femora...	18·5 "	22 "
Length of ovipositor ...	— "	1·5 "

Habitat.—Port Denison, Queensland *(Brunner).*

CAEDICIA HOSPES, *Brunner* (ibid, 196).

Resembling *C. minor*, but much larger. Hind femora below armed with 15-20 spinelets.

	Female.
Length of body	26 mm.
Length of pronotum	7 "
Length of elytra	45 "
Width of elytra	13 "
Length of hind femora	27 "
Length of ovipositor	2 "

Habitat.—Amboyna *(Brunner).*

CAEDICIA OBTUSIFOLIA, *Brunner* (ibid).

Vertex very oblique. Fore tibiæ unarmed above (except apically). Radial branch forked much before the middle. Hind femora below with 8-10 spinelets. Ovipositor very small. Eyes oblong. Elytra rounded at apex.

	Male.	Female.
Length of body	23 mm.	23 mm.
Length of pronotum ...	5 "	5 "
Length of elytra	28 "	28 "
Width of elytra	9 "	9 "
Length of hind femora ...	17 "	17 "
Length of ovipositor ...	— "	1·5 "

Habitat.—Cape York, Queensland (*Brunner*).

Caedicia acutifolia, *Brunuer* (ibid, 197).

Vertex flat, eyes globose. Elytra distinctly acuminate. Radial vein with four branches. Hind femora below armed with 12-15 spinelets along anterior margin. Ovipostor very short.

	Female.
Length of body	28 mm.
Length of pronotum	6 "
Length of elytra	38 "
Width of elytra	10 "
Length of hind femora	21 "
Length of ovipositor	1·5 "

Habitat.—Cape York, Queensland (*Brunner*).

Caedicia bispinulosa, *Brunner* (Br. Mon., 197).

Size small. Vertex flat. Eyes globose. Elytra with scattered brownish dots in the disk, radial branch forked in the middle. Hind femora below, with two apical spots. Ovipositor long roundly curved and acuminate.

	Female.
Length of body	21 mm.
Length of pronotum	4 "
Length of elytra	27
Width of elytra	6·5
Length of hind femora...	15 "
Length of ovipositor	3 "

Habitat.—Sydney, New South Wales (*Brunner*).

Caedicia hirsuta, *spec. nov.*

Size small. Eyes oval, brown. Pronotum subconcave, de flexed lobes rounded below, equally high as long. Elytra rather narrow; veinlets of marginal area irregular and distant, connected by crowded reticulation, first radial branch forked before the middle, succeeded by three more, of which the last is forked near its termination; anterior ulnar vein with two to three branchlets. Legs very slender, all covered, as well as the pronotum, with short stiff hairs. Hind femora spined below, the others unarmed. Fore and middle tibiæ with minute spines

below, also hind tibiæ above and partly below. Meso- and meta-sternal lobes triangular, acuminate, latter much larger than the former. Abdomen, subgenital lamina, and cross-wise incurved cerci hirsute.

	Male.
Length of body	20 mm.
Length of pronotum	5 "
Length of elytra	37 "
Width of elytra	8–10 "
Length of hind femora	24 "
Length of hind tibiæ	24 "

Habitat.—Yam Creek, North Australia (*Prof. R. Tate*, March, 1882.

This species differs from all others within the group by the short stiff tomentum with which most parts are invested, and by the ulnar vein being branched and forked. There are only two male specimens, which originally may have been green, but through long immersion in alcohol, have become uniformly pale testaceous in colour. When the female is discovered it may perhaps be necessary to form a new genus for the reception of this species.

Caedicia roseopennis, *spec. nov.*

Green and ferruginous. Size small. Vertex flat. Eyes globose, brown with black markings. Head purplish, pronotum, legs, abdomen, and the elytra in part ferruginous, remainder of the last green. Disk of pronotum bordered purplish-brown laterally. Deflexed lobes angularly inserted, much higher than long, lower margin subsinuate. Elytra resembling those of *Symmachis* in outline and venation, disk with small, remote, dusky spots along the middle, hindmargin with minute, crowded black dots. First radial branch forked much before the middle, second simple, third indistinct, much bent and ramified. Tympanal area of male very short, plicate veins irregular and enclosing a subcircular opaque area of dark-brown colour. Wings transparent, pale rose-colored, except towards apex, veinlets green. All femora wholly unarmed, marked with fuscous stripes exteriorly. Fore tibiæ subterete above, with a few spinelets below towards apex. Meso- and meta-sternal lobes subrotundate, latter much larger than former. Ovipositor not much longer than cerci, much incurved, gradually acuminate. Subgenital lamina of male terminating in two slender terete lobes.

	Male.	Female.
Length of body ...	13 mm.	20 mm.
Length of pronotum ...	4 "	5 "
Length of elytra ...	24–26 "	25 "
Width of elytra ...	5 "	6 "
Length of hind femora	13 "	14 "
Length of ovipositor ...	— "	2½ "

Habitat.—Cooke's Plains, east of the Lower Murray River, where one female and four males were captured by the author on January 5th, 1887. The insects appeared to feed on *Bursaria spinosa.*

This species resembles *Symmachis* considerably in outline and venation of the elytra, and also in the form of the deflexed lobes of the pronotum, it also appears to exhibit affinities with *C. inermis* and *C. bispinulosa* ; from all of which it differs by the rosy colour of the wings, the form of the lobes of the pronotum, the unarmed femora, &c.

CAEDICIA PORRECTA, *Brunner* (Mon. Add. 96).

Dull olive-green. Eyes oblong. Pronotum with the disk very flat, scarcely wider behind, lateral ridges brownish red, deflexed lobes highest beyond the middle. Elytra wider than the length of pronotum, the first radial branch forked in the middle and again near its end. Hind tibiæ sulcate above and unarmed, excepting the apical spine. Hind femora spined towards the apex. Ovipositor very short.

	Female.
Length of body...	26 mm.
Length of pronotum	6·8 "
Length of elytra	40 "
Width of elytra	9 "
Length of hind femora...	22 "
Length of ovipositor	2 "

Habitat.—Rockhampton, Queensland.

Genus DIASTELLA, *Brunner* (Br. Mon., 198).

Elytra widest in about one-third part of their length from the apex ; radial branch forked at (or near) the base. Fore tibiæ sulcate and unarmed, excepting the apical spine. All femora spinulose below. Besides other distinctions, this genus differs from the preceding by the short broad anterior femora.

DIASTELLA LATIFOLIA, *Brunner* (ibid, fig. 56).

Pale green. Antennæ, and also the fore and middle legs brownish-yellow marbled with brown. Hind tibiæ with two brownish bands. Elytra coriaceous, opaque. Abdomen purplish above.

	Male.
Length of body	23 mm.
Length of pronotum	6 "
Length of elytra...	39 "
Width of elytra	12 "
Length of hind femora	21 "

Habitat.—Moreton Bay, Queensland *(Brunner).*

Diastella flexuosacercata, *Brunner* (ibid, 98).

Pronotum scarcely wider behind than in front. Elytra with zebra-like oblique brownish stripes. Cerci of male elongate and flexuose.

	Male.
Length of body	22 mm.
Length of pronotum	5 "
Length of elytra	37·5 "
Width of elytra	10·2 "
Length of hind femora	21 "

Habitat.—New Guinea.

Genus Protina, *Brunner* (Mon. Add., 10, 98, fig. 16).

Face somewhat swollen. Pronotum rather large, not constricted, disk anteriorly plain, posteriorly-produced and suddenly incurved, forming a pointed transverse ridge, deflexed lobes roundly inserted, highest behind the middle. Elytra broad, first radial branch forked before the middle. Hind femora with compressed base, spined beyond the middle. Hind tibiæ curved towards the apex. Mesosternal lobes triangular, metasternal rounded. Ovipositor rather long.

Protina guttulata, *Brunner* (ibid).

Olive-green. Antennæ ringed with black. Elytra with distant, small, irregularly-scattered brown spots.

	Female.
Length of body	33 mm.
Length of pronotum	8·5 "
Length of elytra	50 "
Width of elytra	15 "
Length of hind femora...	27 "
Length of ovipositor	7 "

Habitat.—Peak Downs, Queensland.

Genus Symmachis, *Brunner* (Br. Mon., 21, 199).

Fastigium of vertex obtuse, horizontally contiguous with the frontal one. Elytra broadest in the middle or beyond, radial branch forked in the middle, tympanal area of male very short.

Brunner established the genus upon the male only. I consider a specimen of a female in the Adelaide Museum as appertaining to this genus ; it has served me for the following description.

Symmachis lacteipennis, *Brunner* (ibid, fig. 57).

Whitish-green. Head, pronotum, and femora whitish. Lower margin of deflexed lobes of pronotum semi-circularly rounded, gradually passing into hindmargin. Elytra pale-green, pellucid, postradial vein much curved at apex, terminating in hindmargin;

first radial branch forked before the middle, second and third simple; ulnar vein much branched, forked at its termination, reaching hindmargin one-third from apex; primary transverse veinlets net-like branched. Tympanal area simple, without transverse, raised veins, a small brown spot at the base opposite to another near hind angle of disk of pronotum and a third at the termination of the plicate vein. Anterior tibiæ near foramina and at the base, also the ulterior lobes of anterior tarsi, fuscous. Ovipositor short, broadly lanceolate, acute, hirsute (as well as cerci, which it scarcely exceeds), disk shining, margins most minutely serrate at and near apex. Subgenital lamina very short, sub-triangular.

	Male.	Female
Length of body	17 mm.	15 mm.
Length of pronotum ...	5 "	4 "
Length of elytra	30 "	28 "
Width of elytra	7 "	7 "
Length of hind femora ...	18 "	15 "
Length of ovipositor ...	—	2·5 "

Habitat.—Murray Bridge, South Australia, where the female was captured by Mr. C. Poare during the early part of April, 1891. The insect appears to be rare.

Notwithstanding the discrepancy of the smaller size of the female, which may be due to dwarfing or locality, and other differences, hesitation to form a new species seems to be justified in this case, until more material comes to hand.

Genus Dictyota, *Brunner* (Br. Mon. 22, 199).

Pectus compressed. Meso- and meta-sternal lobes longer than broad. Deflexed lobes of pronotum highest beyond the middle, inferior margin emarginate over the coxæ. Elytra with the transverse veinlets in close parallel lines in the marginal area. Base of hind femora very slender.

Besides the above synoptical characters the genus is distinguished by the short vertex, the high ridges surrounding the antennæ, which exceed the frontal vertex considerably, and the sharply angular pronotum.

The exceptional character of free styles in connection with the subgenital lamina connects this genus with several other groups notably the Eurypalpæ (monotypic) from Borneo, Sumatra, &c.

Dictyota viridissima, *Brunner* (Br. Mon., 199).

Bright-green and whitish. Pronotum with rough, transverse, lateral ridges very minute or absent. Elytra in the middle about one and a-half times as wide as the length of the pronotum; transverse veinlets in the marginal area rather remote, radial branch forked in the middle. Size small.

	Male.	Female.
Length of body	22 mm.	25 mm.
Length of pronotum ...	5 "	6 "
Length of elytra	31 "	40 "
Width of elytra	7·5 "	11 "
Length of hind femora ...	20 "	26 "
Length of ovipositor ...	-- "	4 "

Habitat.—Rockhampton, Moreton Bay, Queensland *(Brunner).*

DICTYOTA INDIVISA, *spec. nov.*

Size moderate. Head (except vertex), all femora, and sternum whitish. Pronotum wider behind, lateral carina ferruginous. Eyes brown. Elytra dull olive-green, radial and ulnar veins brownish, former bordered paler at the base. Transverse veinlets in the marginal area rather remote. Radial veins widely separate at the apex, first branch not forked, nor any of the three succeeding ones (to this character the specific name alludes). Cerci not much incurved. Abdomen greenish, banded with brown. Ovipositor about twice as long as the cerci.

	Female.
Length of body	23 mm.
Length of pronotum	6 "
Length of elytra...	38 "
Width of elytra	9 "
Length of hind femora	19 "
Length of hind tibiæ	14 "
Length of ovipositor	5 "

Habitat.—Vicinity of Adelaide, the only specimen before the author, having been captured by Mr. Zietz, jun., in the parklands of the city on April 26, 1889. It appears to have been overlooked hitherto by collectors.

The species is allied to *D. viridissima*, Brunner, but differs chiefly in proportions, the four simple radial branches, and the comparatively short hind tibiæ.

DICTYOTA COSTULATA, *Brunner* (ibid, 201).

Size large. Olive-green, head and pronotum whitish, latter with rough transverse ridges; transverse veinlets of marginal area of elytra very close, radial branch forked much before the middle, succeeded by three simple ones.

	Male.
Length of body	30 mm.
Length of pronotum	9 "
Length of elytra...	50 "
Width of elytra	13 "
Length of hind femora	29 "

Habitat.—Sydney, New South Wales *(Brunner).*

Dictyota pruinosa, *Brunner* (Br. Mon., 201, fig. 58).

Size large. Brownish-green; head, pronotum, and the base of elytra and femora whitish. Lateral ridges of pronotum rough and scabrous. Width of elytra twice the length of pronotum, form lanceolate, apex acuminate; transverse veinlets of marginal area very close; radial branch forked in the middle. Fore coxæ with a small spine.

	Female.
Length of body	38 mm.
Length of pronotum	10 "
Length of elytra	65 "
Width of elytra	20 "
Length of hind femora	33 "
Length of ovipositor	4 "

Habitat.—New Holland; Auckland, New Zealand *(Brunner)*.

Size and the whitish dust covering it give the species the aspect of *Stilpnochlora*, a Brazilian and West Indian genus of the group Steirodontia, otherwise far removed.

Dictyota Elderi, *spec. nov.*

Size moderate. Pale-green. Head, pronotum (except hind-margin and posterior angles of deflexed lobes, which are green), all the legs, base of elytra, abdomen, and the under side of the thorax creamy or testaceous-white. Disk of pronotum equally wide in front and behind, lobes with three furrows, all rough with minute pits. Elytra lanceolate, broadest at or slightly beyond the middle, apex rounded; transverse veinlets in marginal area moderately crowded, in parts considerably reticulate; ulnar vein brown; radial veins much separated at the apex, the posterior terminating in the apex; first radial branch forked beyond the middle, and succeeded by two simple ones. Hind femora slender, subterete. Hind tibiæ almost triangular, spines below small to minute.

	Female.
Length of body	30 mm.
Length of pronotum	6·5 "
Length of elytra	40 "
Width of elytra	10 "
Length of hind femora	30 "
Length of hind tibiæ	21 "
Length of ovipositor	3 "

Habitat.—Mount Squires, Central Western Australia, where the only specimen extant was captured by Mr. R. Helms, the botanist to the Elder Exploring Expedition, in August, 1891. It has been named in honour of the generous promoter of the expedition—Sir Thomas Elder—at whose sole expense it has been con-

ducted, and who has greatly benefited the cause of geographical science and natural history during his life.

The species is allied to *D. pruinosa*, but differs in size, colour, proportions, the branches of the radial vein, its termination in the apex, &c.

Genus Polichne, *Stäl.* (Br. Mon. 22, 202).

Front prominent, elongate. Eyes very oblong. Elytra linear, narrowed. Deflexed lobes of pronotum longer than wide, with the hind margin much rounded. Hind margin of meso- and meta-sternum truncate. Base of hind femora not dilated, wholly unarmed.

The genus has the aspect of *Tylopsis*, an Old-World genus forming a monotypic group, on account of its long forehead, the long narrow lobes of the pronotum and narrow elytra, but its other characteristics place it among the Ephippithytæ.

Polichne parvicauda, *Stäl.* (ibid, fig. 59).

Pale-green or testaceous. Front white. Ridges of pronotum reddish.

	Male.	Female.
Length of body	15 mm.	18 mm.
Length of pronotum ...	4 "	4 "
Length of elytra	29 "	30 "
Width of elytra	4 "	4 "
Length of hind femora ...	20 "	22 "
Length of ovipositor ...	—	3 "

Habitat.—Mount Lofty Range, Kangaroo Island, Tintinarra (S.E.), South Australia; Dimboola, Caromby, (N.W.) Victoria *(Tepper)*; Sydney, New South Wales; North Australia; Lord Howe's Island *(Brunner)*.

The species varies considerably in colour, viz., from bright-green to pale-testaceous, apparently due to its surroundings or the food taken, for among the green grass no pale specimens, nor among the dry later in season any green ones, appear to be taken. The dark-brown or purplish bordering of the pronotum is, however, constant. The individuals, although never numerous, are not rare in grassy scrublands and fields from January to March. There are some ten specimens in the collection at the Adelaide Museum, six of which are green, the others pale, both comprising both sexes.

Polichne ferruginea, *spec. nov.*

Size somewhat smaller than the preceding. Ferruginous. Face, pectus, and femora rather pale. Meso- and meta-notum testaceous. Elytra very narrow, rounded at apex, posterior radial vein forked at apex, both branches curved and terminatin

in the hind margin ; transverse veinlets much raised, oblique or at right angles, crowded in ulnar area except at base. Veins and veinlets of the wings ferruginous. Cerci straight, divergent. Supra-anal lamina deeply emarginate. Ovipositor rather long, slightly shorter than the valves.

	Female.
Length of body	16 mm.
Length of pronotum	4 "
Length of elytra	30 "
Width of elytra	3 "
Length of hind femora	21 "
Length of ovipositor	3 "

Habitat.—Mount Lofty Range, South Australia.

The species is described from a single specimen obtained by Mr. E. Guest at Balhannah, but appears to be sufficiently distinct to merit specific rank. It has to be mentioned, that among the individuals placed under *P. parvicauda* by the author, there is a testaceous form with short elytra, comparatively broad, and more rounded at the apex, than those of the green ones. These *may* ultimately prove to form a separate species.

Polichne brevipes, *Brunner* (Mon. Add. 99).

Size small. Eyes large, globose. Deflexed lobes of pronotum equally high and long, rounded below. Elytra green, tympanal area of male with a shining black spot. Hind femora scarcely exceeding the elytra one and a-half times, minutely spined below.

	Male.
Length of body	16 mm.
Length of pronotum	4·5 "
Length of elytra	31 "
Length of hind femora	16 "

Habitat.—Peak Downs, Queensland.

Polichne longipes, *Brunner* (ibid).

Size large. Pronotum very short, deflexed lobes somewhat higher than long. Fore femora brownish below, with some black spinelets. Hind femora exceeding the elytra two or three times, spined distantly below.

	Female.
Length of body	20 mm.
Length of pronotum	4·5 "
Length of elytra	33 "
Length of hind femora	24 "

Habitat.—Rockhampton, Queensland.

Polichne argentata, *Brunner* (ibid).

Green. Size small. Fastigium of vertex rather broad, sulcate.

Deflexed lobes of pronotum with a silvery white margin. Marginal area of elytra black-reticulate, with irregular ivory-white veinlets ; margin hyaline.

	Male.	Female.
Length of body	17 mm.	17 mm.
Length of pronotum ...	3 "	3·6 "
Length of elytra ...	21 "	24 "
Length of hind femora ...	16·5 "	20 "

Habitat.—Peak Downs, Queensland.

Polichne spinulosa, *Brunner* (ibid, 101).

Size large. Eyes oblong. Fore and middle femora spined along the whole external margin, hind femora in the middle alone.

	Female.
Length of body	22 mm.
Length of pronotum	5 "
Length of elytra	32 "
Length of hind femora	25 "

Habitat.—Rockhampton, Queensland.

Genus Paracaedicia, *Brunner* (Mon. Add. 10, 101, fig. 17).

Resembles Caedicia, but the fore tibiæ are terete or sulcate above, and quite smooth, also with conchate foramina in front and open ones behind. Meso- and meta-sternal lobes triangular.

This genus contains New Guinea and Sunda Island species, and forms the connection between the Ephippithytæ and Phlaruocentra groups, the latter being of African habitat. They are large insects, with large broad elytra.

Paracaedicia tibialis, *Brunner* (ibid).

Elytra one-coloured, lanceolate, first radial branch forked long before the middle, transverse veinlets irregularly reticulate, radial vein emitting 3 or 4 branches into the hindmargin besides the first one. Fore tibiæ above at the base and the hind ones below wholly black.

	Female.
Length of body	36 mm.
Length of pronotum	8·2 "
Length of elytra	50 "
Width of elytra	13 "
Length of hind femora...	27 "
Length of ovipositor	2 "

Habitat.—Key Island.

Paracaedicia raroramosa, *Brunner* (ibid).

Fore tibiæ not black, hind ones black above. Two radial branchlets besides the first.

	Female.
Length of body	33 mm.
Length of pronotum	9 "
Length of elytra	54 "
Width of elytra	15 "
Length of hind femora...	30 "
Length of ovipositor	3·5 "

Habitat.—Halmahera (? !) Island.

PARACAEDICIA OBESA, *Brunner* (ibid).

Fore and hind tibiæ uniformly green Disk of pronotum almost round, deflexed lobes roundly inserted. Hind femora towards apex sparsely spined. Anal segments of male with two horns. Cerci simple.

	Male.	Female.	Var. minor male
Length of body ...	23 mm.	30 mm.	21 mm.
Length of pronotum	6 "	7·8 "	5·2 "
Length of elytra ...	39 "	47 "	36 "
Width of elytra ...	9 "	11·5 "	7·3 "
Length of hind femora	21 "	24·5 "	17·5 "

Habitat.—New Guinea, Easter Islands.

PARACAEDICIA SPINOSA, *Brunner* (ibid, 103).

Anal segment of male truncate. Cerci with a long spine internally.

	Male
Length of body	22 mm.
Length of pronotum	6 "
Length of elytra...	36 "
Width of elytra	7 "
Length of hind femora	22 "

Habitat.—Aru Islands.

PARACAEDICIA SERRATA, *Brunner* (Mon. Add. 103).

Hind femora below densely serrate for the whole length. Fore and middle tibiæ flattened.

	Female.
Length of body	34 mm.
Length of pronotum	8 "
Length of elytra	50 "
Width of elytra	14 "
Length of hind femora	26 "
Length of ovipositor	2 "

Habitat.—New Guinea.

PARACAEDICIA PLANICOLLIS, *Brunner* (ibid, 104).

Disk of pronotum flat, deflexed lobes angularly inserted,

equally long and high. First radial branch forked angularly at the base. Fore femora smooth below, hind ones with 12-15 spinelets.

	Female.
Length of body	21 mm.
Length of pronotum	6 "
Length of elytra	40 "
Width of elytra	10 "
Length of hind femora	24 "

Habitat.—Uncertain.

PARACAEDICIA NIGROPUNCTATA, *Brunner* (ibid).

Elytra dotted all over with small, distant, black spots; they scarcely exceed the length of the pronotum in width.

	Female.
Length of body...	23 mm.
Length of pronotum	5·5 "
Length of elytra	46 "
Width of elytra	7·5 "
Length of hind femora	23·2 "
Length of ovipositor	2 "

Habitat.—New Guinea.

PARACAEDICIA VERRUCOSA, *Brunner* (ibid).

Elytra with callous white dots accompanying in series the radial veins, first radial branch forked in the middle.

	Male.
Length of body	25–28 mm.
Length of pronotum	7–7·8 "
Length of elytra	42–48 "
Width of elytra	11–12 "
Length of hind femora	24–27 "

Habitat.—Aru Islands.

F. GROUP TAENIOMENÆ (Br. Mon. 22, 203).

Ovipositor as long or longer than the pronotum, its margin serrulate or crenulate near the apex, rarely smooth. Subgenital lamina of male with free styles, or without them. Fore and middle tibiæ sulcate above and mostly spined along the external margin. (These characters also apply to several other but non-Australian groups.) Fore tibiæ spined above, but the apical spine is absent. Elytra with the frontal margin dense and ivory-white. Subgenital lamina of male with articulately-inserted styles. Ovipositor much longer than the pronotum, gradually curved, acuminate, and with the disk bright.

Restricted to Australia.

Genus Taeniomena, *Brunner* (ibid).

Synonym, *Tinzeda*, part, Walker (Brit. Mus. Cat.)

Hind femora unarmed below. Deflexed lobes of pronotum longer than wide, lower margin nearly straight. Ovipositor distinctly serrulate.

Besides these, the principal distinctions are the narrow pointed elytra, with white stripes; the long slender legs, and the long attenuated ovipositor.

Taeniomena albosignata, *Brunner* (ibid, 204, fig. 60).

(Tinzeda eburnina, pars. ?, Walker).

Yellowish-green. Face whitish; a bright-white line in the middle of the pronotum, along the lower margin of the deflexed lobes, along the costal margin of the elytra, the interior side of the radial vein, and at the base of the tympanal area of the left elytron; the costal margin and the radial vein being also narrowly marked with a ferruginous border, and the base of the post-ulnar vein with a blackish streak. Deflexed lobes of pronotum much longer than high, hind angle rounded. Elytra very narrow, much acuminate, not extending beyond the ovipositor of female, but much longer in male. Radial veins distant at base and apex, contiguous intermediately. First radial branch not forked, following one or two simple. Anterior-ulnar vein straight, parallel with radial, long. Tympanal area of male with a stout plicate vein, which is much raised in left elytron, and joined to a semicircular continuation posteriorly. Wings slightly longer than elytra. Fore femora below unarmed, or with a few minute black spines. Subgenital lamina of male narrow, hindmargin roundly emarginate. Ovipositor long and broad, gradually acuminate, finely serrated towards apex for the third part of its length.

	Male.	Female.
Length of body	15 mm.	20 mm.
Length of pronotum ...	4 "	4 "
Length of elytra	33 "	26 "
Width of elytra	4·5 "	5 "
Length of hind femora ...	22 "	25 "
Length of ovipositor ...	—	12 "

Habitat.—Tintinarra, S.E. (January 7, 1887, *Tepper)*, Lucindale (December 24, 1891, *L. Campbell)*, Adelaide, South Australia; Sydney, New South Wales; Port Denison, Queensland *(Brunner)*.

This species is at once recognisable by the elytra of the female scarcely exceeding the ovipositor, and the roundly emarginate subgenital lamina. There are two females and one male in the Adelaide Museum. The ova are elongate-oval and almost flat, being 4 mm. long, 2 mm. wide, and brownish-grey.

Taeniomena soror, *Brunner* (Br. Mon., 204).

Bright-green ; similarly marked, but larger than the preceding. Deflexed lobes of pronotum much higher behind the middle. Elytra in both sexes much longer than hind femora, without the border of dark dots along the radial white line. Fore femora distinctly spined (3-5). Subgenital lamina very elongate, hind margin cleft. Ovipositor not much curved, very flat, very slightly narrowed, toward apex serrulate-dentate, brown, the remainder pale- to dark-green.

	Male.	Female.
Length of body	16 mm.	20 mm.
Length of pronotum ...	5 "	5–6 "
Length of elytra	36 "	31 "
Width of elytra	5 "	5 "
Length of hind femora ...	26 "	26 "
Length of ovipositor ...	—	10–12 "

Habitat.—Mount Lofty Range, near Adelaide (two females one male), Roseworthy scrub (one male), South Australia.

The species is readily recognizable by the sub-triangular form of the deflexed lobes of the pronotum (which are much wider than in *T. albosignata*), and the elytra extending considerably beyond the hind femora. Both are distinguished from all other described species by the long slightly-curved ovipositor. The leaves of *Bursaria spinosa* appear to supply the food of *T. soror*, all the specimens were found on those bushes.

One of the males placed in this species has the anterior vein furnished with three distinct branches, and the subgenital lamina deeply cleft, although otherwise resembling the other. In the absence of more material it was not thought advisable to form another species.

Taeniomena sororoides, *spec. nov.*

Pale-green to testaceous, marked with ivory stripes like *T. albosignata*, the stripe of the pronotum extending triangularly over the head to the vertex of the fastigium, and those of the marginal and radial areas (along the posterior border) are marked more or less distinctly by irregular, minute, black or dusky dots. Deflexed lobes of pronotum narrow, oblique, as high or higher than long, and highest at or slightly beyond the middle, lower margin sub-semicircularly rounded. Elytra narrowed from near the base. Plicate vein of the tympanal area of male prominent and oblique on left elytron. Subgenital lamina with base of emargination cleft, apices incurved. Ovipositor shorter and more incurved than in *T. soror*, finely and closely dentate at and near apex.

	Male.	Female.
Length of body ...	13 mm.	17 mm.
Length of pronotum	4 "	4·5 "
Length of elytra ...	30–39 "	32–34 "
Width of elytra ...	3 "	3 "
Length of hind femora	20–26 "	23 "
Length of ovipositor...	—	7–9 "

Habitat.—Mannum, Leigh's Creek, Western Plains, Port Pirie Parallana and Adelaide (?), South Australia.

This species is distinguished from others by the shorter more curved ovipositor and the high, narrow, oblique lobes of the pronotum. There are four males and as many females in the collection, all more or less bleached and two totally so through immersion in alcohol, the colour is therefore uncertain, the line of blackish dots along the radial ivory-line is, however, quite constant. As the specimens have been gathered from such distant localities, the matching of the sexes is not quite beyond a doubt.

TAENIOMENA LOBATA, *Brunner* (Br. Mon., 205).

Pale-testaceous. Front and sides of face, base of antennæ, middle line and lower half of lobes of pronotum, broad border of marginal area, underside of pectus, and the thick part of hind femora almost white ; lateral border of pronotum, a short streak near base of anterior radial vein, post-ulnar vein from tympanal area along nearly the entire length of hindmargin of elytra, the branch at the plicate vein, and a streak on the upper side of the hind femora are blackish. Vertex of fastigium much pointed, and beak-like produced. Bases of antennæ very stout and subcontiguous with the fastigium. Disk of pronotum more or less flat, the deflexed lobes small, narrow, the hind angle produced as a long keeled lobelet (keel blackish). Elytra with radial and ulnar veins very remote at the bases. Tympanal field of male short, plicate vein in both elytra not much raised. All femora unarmed. Cerci of male long semicircularly incurved. Subgenital lamina semicircularly emarginate, nearly as long as the cerci. Ovipositor much longer than pronotum, semicircularly-incurved, flat, broad, acuminate, shining, apex blackish or brown, both margins near apex serrulate or dentate (smooth in the nymph-stage).

	Male.	Female.
Length of body	11 mm.	13 mm.
Length of pronotum ...	3 "	3 "
Length of elytra	24 "	30 "
Width of elytra	3 "	4 "
Length of hind femora ...	— "	24 "
Length of hind tibiæ ...	— "	25 "
Length of ovipositor ...	— "	5–6 "

Habitat.—Tanunda, Riverton, Mount Bryan, South Australia; Coromby, N.W. Victoria *(Tepper);* New South Wales *(Brunner).*

The species is distinguished from all the others by the upper angle of the posterior margin of the narrow lobes of the pronotum being produced into a keeled lobelet, and the pale colour; both of which characters and the general aspect are so abnormal for the genus, that the formation of a separate one for its reception and, perhaps, that of *T. minor*, mihi, might be permissable. The insects are not very rare, and live among the dry grass from November to January. There are one male (without hind femora) and three females (one a nymph) in the Adelaide Museum.

Taeniomena Fraserensis, *spec, nov.*

Moderately large. Head, base of antennæ, legs and underside of pectus pale-glaucous-white. Antennæ testaceous. Eyes brown. Disk and lobes of pronotum, also marginal area of elytra glaucous, remainder of latter olive-green. Abdomen above brownish-black, terminal segment whitish, underside, &c., brownish-testaceous. Palpi and tarsi green. Disk of pronotum almost flat, wider behind, deflexed lobes as high as long, lower margin semicircularly rounded, widest in the middle, white border nearly obsolete. Elytra widest at base, transverse venules very distinct, crowdedly reticulate in the marginal area; radial veins widely separate at base, then closely contiguous, and again separating considerably somewhat beyond the middle. White lines broad, the posterior bordering of dark-reddish or blackish dots, striæ very distinct; posterior margin entirely bordered with brown. Tympanal area green, short; plicate vein pale, straight, much raised (but not branched), shining. Fore femora with two or three spinelets, hind femora with five or six. Cerci semicircularly incurved, sharply acuminate, tips black. Subgenital lamina not as long as the cerci, posterior margin triangularly emarginate, apex of lobe acuminate.

	Male.
Length of body	20 mm.
Length of pronotum	5 "
Length of elytra	38 "
Width of elytra	5 "
Length of hind femora	23 "

Habitat.—Fraser Range, interior of Western Australia.

The remarkably bright colouring, the form of the lobes of the pronotum, the emargination of the subgenital lamina, and the venation of the elytra separate this species from the others. Some specimens of *T. sororoides*, mihi, from Parallana, in the far north of South Australia, resemble it in size and general aspect; but the form of the lobes is different, and the radial

branch (in one instance) crosses the anterior-vulnar vein. The only specimen in the Adelaide Museum was taken by Mr. R. Helms, collector to the Elder Exploring Expedition, in November, 1891.

TAENIOMENA MINOR, *spec. nov.*

Grass-green, face paler. White lines along radial vein and the base of tympanal area wholly obsolete. Disk of pronotum somewhat concave, middle white line continued to vertex of fastigium. Deflexed lobes longer than high, wider behind, inferior margin nearly straight, with narrow white border. Elytra brownish at apex, medial-plicate vein of tympanal area strongly raised, almost transverse; shoulder-vein very marked; hindmargin of area sharply curved, brownish. Fore and middle femora and tibiæ almost unarmed; hind femora entirely so. Cerci of male incurved, subgenital lamina rather widely cleft, tips incurved. Ovipositor widest at base, gradually acuminate, much curved, near apex finely dentately serrate.

	Male.	Female.
Length of body	13 mm.	17 mm.
Length of pronotum ...	3·5 "	4 "
Length of elytra	30 "	28 "
Width of elytra	4 "	4 "
Length of hind femora ...	21 "	22 "
Length of ovipositor ...	—	9 "

Habitat.—Callington, South Australia (*Tepper*), feeding on *Acacia calamifolia*, November 25, 1887, and apparently limited to sandy scrublands.

This species differs from others by the total absence of the white line along the posterior radial vein, its slender form of body, and several other characters.

Genus ELEPHANTODETA, *Brunner* (Br. Mon., 22, 206).

(*Tinzeda*, pars., Walker).

Hind femora spined below. Deflexed lobes of pronotum equally high and long, lower margin rounded. Ovipositor broadest in the middle, the margins very minutely serrated.

Wholly restricted to Australia.

The genus resembles DICTYOTA, on account of the whitish dust covering the forepart, and TAENIOMENA, in the corneous bordering of the base of the elytra, also in the absence of the apical spine of the fore tibiæ (which is usually the last to disappear); but differs in the characters indicated above. The generic name refers to the *ivory-like* border of the elytra.

ELEPHANTODETA EBURNATA, *Brunner* (Br. Mon., 207, fig. 61).

Size large. Head and pronotum yellowish-green, frontal margin from the base bordered bright ferruginous, blackish-inclined at

the base, marginal area milky-white at the base. Ovipositor about two and a-half times the length of the pronotum, base greenish, margins ferruginous.

	Female.
Length of body...	... 34 mm.
Length of pronotum	... 7–8 "
Length of elytra	... 47–51 "
Width of elytra	... 10 "
Length of hind femora... ...	... 30–32 "
ength of ovipositor	... 17 "

Habitat.—Sydney, New South Wales; Cape York, Queensland; Lord Howe's Island *(Brunner)*.

ELEPHANTODETA FARINOSA, *Brunner* (ibid).

Size moderate. Head, pronotum, and base of femora whitish or glaucous-green. Disk of pronotum rounded, with a faint whitish or yellowish line in the middle. Elytra pale grassy- or olive-green, the frontal margin at the base of the marginal area hoary in the male, milky-white in the female, with a short dark streak on the inner edge at the shoulders. Abdomen of female banded alternately green and purplish-brown, the latter tint usually narrower than the former. Ovipositor green at base, remainder brown, apex darkest; broad, compressed, semicircularly curved, apex much elevated, finely dentate at the underside, total length about one and a half times that of the pronotum.

	Male.	Female. (Dried specimens.)
Length of body ...	15 mm.	20–23 mm.
Length of pronotum ...	5 "	5 "
Length of elytra ...	38 "	36–31 "
Width of elytra ...	6 "	7 "
Length of hind femora	20 "	21–24 "
Length of hind tibiæ...	23 "	23 "
Length of ovipositor ...	— "	8–9 "

Habitat.—Brighton *(Dreyssig)*, Mount Lofty Range, Murray Bridge *(Tepper)*, Morgan *(Evans)*, Teatree Gully *(Smith)*, Goolwa *(Zietz)*, Balaklava *(Lewis)*, Dowlingville *(Willis)*, South Australia; New Holland *(Brunner)*.

This species differs from the preceding one in smaller size, proportion of length of ovipositor to that of pronotum, the pale medial line of the latter, &c., and is widely distributed in the southern parts of South Australia, where the other appears to be absent. There are seven females and one male in the Museum collection, and it is a curious fact, that in three specimens of the former, the first radial branch is *forked* beyond the middle, in the right elytra, but simple in the left, while the other four specimens exhibit normal and symmetrical venation.

G. Group PHANEROPTERÆ (Br. Mon., 23, 209).

Hind tibiæ spined above or unarmed, the apical present only at the external margin. Fastigium of vertex acuminate. Elytra linear or lanceolate, mostly longer than the wings. Fore and middle tibiæ smooth above, excepting the apical spine (characters also applying to numerous other groups, containing Old World species almost exclusively). Elytra very narrow, radial veins distinctly separated at the base. Subgenital lamina of male without styles, or, if present, extremely minute.

Genus PHANEROPTERA, *Serville* (Br. Mon., 23, 209, fig. 63).

Disk of pronotum almost flat, as are also the deflected lobes of the male. Elytra with the hindmargin straight or sub-rotundate. All femora unarmed below. Wings much longer than the elytra.

The 11 species of this genus inhabit Europe, Asia, Africa, some of the Malayan islands, and a single is recorded by Brunner from "North Australia;" whether rightly so or not must for the present remain doubtful until specimens have come to hand from there.

PHANEROPTERA SUBNOTATA, *Stäl* (ibid, 215).

Yellowish-green. Antennæ pale yellow at base, brownish beyond. Subgenital lamina longer than cerci of male, much attenuated, sub-tubular, apex emarginate and incised.

	Male.	Female.
Length of body	12 mm.	14 mm.
Length of pronotum ...	3 "	3·2 "
Length of elytra ...	14·5 "	17 "
Length of hind femora ...	14 "	16 "
Length of ovipositor ...	—	4·5 "

Habitat.—North Australia, Borneo, Singapore *(Brunner)*, Philippine Islands *(Stäl)*, Java, &c. *(Serville)*.

Genus AGNAPHA, *Brunner* (Mon. Add., 14, 108).

Resembles PHANEROPTERA in habit. Pronotum with the disk flat, deflexed lobes trapezoid in shape and higher than long. Elytra scarcely wider than the length of pronotum. Wings hardly exceeding the elytra. Fore femora spined below.

The genus is restricted to Oceanic islands.

AGNAPHA FUSCA, *Brunner* (ibid).

Brownish-ferruginous. Occiput with four black stripes; these are continued over the pronotum forming two discoidal ones and sometimes one along each of the lateral ridges. Elytra dull ferruginous with brown stripe. Wings smoky with darker tips.

	Female.
Length of body...	20 mm.
Length of pronotum	4·2 "
Length of elytra	27 "
Width of elytra	4·5 "
Length of hind femora...	18 "
Length of ovipositor	7 "

Habitat.—Easter Island.

H. Group ANAULACOMERÆ (Br. Mon., 27, 277).

Fore and middle tibiæ terete, sometimes wholly unarmed, rarely sulcate, and if so the apical spine is either wanting, or if present the meso- and meta-sternal lobes are elongated. (Characters in common with numerous other groups.) Frontal fastigium acuminate or obtuse, not laminately produced (excepting some species of the Anaulacomeræ). Fore femora—sometimes also the middle ones—always terete below, hind ones flattened near the apex. Subgenital lamina of male without styles. Ovipositor mostly longer than pronotum, slightly curved, acuminate, and very bright. (Characters including *Ctenophlebiæ*). Elytra subpellucid, radial branch forked. Deflexed lobes of pronotum either roundly or obtuse-angularly inserted.

This group contains four genera, of one of which two species inhabit some of the Pacific Islands and one Australia (as far as known); otherwise it is essentially South American.

Genus Aulacomera, *Stäl* (ibid, fig. 85).

Disk of pronotum rather flat, without elevated lines.

Thirty species, mostly American; but some also from India, &c.

Aulacomera insularis, *Stäl* (ibid, 295).

Olive-green. Pronotum and legs uniformly green; deflexed lobes equally long and high. Elytra rather broad, first radial branch forked in the middle. Pronotum longer than the face. Ovipositor not much longer than the pronotum. Size small.

	Male.
Length of body...	18 mm.
Length of pronotum	5 "
Length of elytra	28 "
Width of elytra	7 "
Length of hind femora	17 "
Length of ovipositor	6·8 "

Habitat.—Samoa Islands *(Stäl).*

Aulacomera incerta, *Brunner* (Br. Mon., 295, fig. 85*a*, *c*).

Olive. Pronotum flat, lobes equally long and high, roundly

inserted. Elytra linear. Ovipositor one-half longer than pronotum Size large.

	Male.	Female.
Length of body	18 mm.	21 mm.
Length of pronotum ...	5·5 "	5·2 "
Length of elytra ...	32 "	35 "
Width of elytra ...	6 "	7 "
Length of hind femora ...	19 "	20 "
Length of ovipositor ...	—	8·5 "

Habitat.—Tongatabu ; Fiji *(Brunner).*

Aulacomera acuminata, *Brunner* (Mon. Add., 148).

Size small. Pronotum with deflexed lobes longer than high. Elytra with hindmargin rounded, apex acuminate, tympanal area and sometimes the whole hindmargin brownish, first radial branch emitted much before the middle of vein, and forked towards its apex. Anal segment of male truncate, cerci long, incurved, subgenital lamina short, broad, triangularly emarginate.

	Male.
Length of body	15 mm.
Length of pronotum	4·5 "
Length of elytra	22 "
Width of elytra	6 "
Length of hind femora	17·5 "

Habitat.—Queensland.

Narrative of an Exploring Tour Across Melville Island, with Notes on its Botany.

By Maurice Holtze, F.L.S.

[Read June 7, 1892].

In October, 1887, an exploring party left Port Darwin for Melville Island, situated about 40 miles to the north of Port Darwin. It was organized by the Government Resident, the Hon. J. L. Parsons, with the view of exploring the interior of the island, of which, owing to the warlike and uncompromising attitude of its natives, so very little as yet is known. The party consisted of 11 Europeans, five Chinese carriers, and six natives of the mainland, and was under the leadership of a bushman of great experience, Mr. P. Saunders. The aboriginals were taken as scouts, and to assist in night-watching, and their intense fear of the wild inhabitants of the island made them most reliable sentinels. There is an old legend amongst the natives of the mainland that raids had been made in olden times by the savage inhabitants of Melville Island upon those of the mainland, and it was with considerable trouble that these six natives were induced to accompany us.

The party arrived late in the afternoon of the 7th October opposite two small creeks about ten miles north-east from Cape Gambier, where our leader intended to land; the strong tidal influence of Clarence Straits drifted our vessel, however, during the night about 12 miles further to the east, where we landed the next morning on a fine sandy beach. From here we had to cut our way through a dense dry jungle about a mile in width, after which we came to a long mangrove flat, and altered our course to north-north-west. About a mile further we came to a chain of billabongs with plenty of water, which, however, was strongly polluted by buffalos. This creek we followed for about a quarter of a mile, and camped then for the day on an open place, so as to arrange everything for an early start next morning.

During the afternoon a lubra passed our camp, in the distance, who ran away yelling with fright on catching sight of us. Shortly after a native appeared, who harangued us from a distance and evidently ordered us off the island. As I wished to establish some sort of intercourse with the inhabitants, and as he was unarmed and accompanied by a lubra, which showed that he had no intent to attack just then, I advanced alone on him, bearing

in my right hand the universal peace-token of all primitive tribes—a green bough—while my left was shown with the open palm, to prove myself to be unarmed, although I must confess that my revolver was loosened in its pouch and ready for action, and my eyes on the alert. I was allowed to approach him within about ten yards, when he commenced to retreat; but he stopped when I stopped, showing his will to keep me at a distance. He was a strong well-made man, completely nude, while his lubra wore an apology for a bark apron. He made me understand by gesticulations that we should leave the island at once, upon which I did my best to show him we had come as friends, and would leave the island on the opposite coast. I after this offered him a handkerchief, which he took from a bush where I had to put it. A second handkerchief was then demanded for his lubra, and transferred to her in the same way, after which we parted amicably.

The afternoon passed quietly, the packs being adjusted amongst our carriers—each man to carry about half hundredweight, his blanket, and a waterbottle, while each European was to carry his rifle, revolver and ammunition, blanket, mosquito-net, and a water-bottle. Our stores consisted of rice, biscuits, tinned meat, tea, and sugar. A bottle of whisky, together with a few medicines, lint, and bandages, and some rockets for signalling, completed our outfit. During the first watch, about half-past seven, several natives, accompanied by lubras, were heard around the camp. A few shots being fired in the air by the leader's orders, they retired precipitately under discordant screaming, and we were no more disturbed during the night. The next morning we started early, going north for about two miles over a fairly-grassed country, showing signs of being visited by buffalos. At two miles and a-half we reached the summit of the coast range, about 200 feet above the level of the sea, composed of ironstone conglomerate, sparsely timbered with *Eucalyptus*, *Grevillea*, *Acacia*, interspersed with *Bombax*, *Erythrophlæum*, *Metrosideros*. Three miles further on a small permanent creek, with good water running eastward, was crossed, and about three miles further on another creek running north was met.

From this point the country rises gradually and is intersected by low ironstone ridges. Continuing our course for another mile and a-half we camped for dinner, and after a short rest, our leader and Mr. Hingston, the surveyor, went a short distance in an easterly direction, hoping to find a creek to fill the water-bags. In this they succeeded at a distance of about 200 yards, but while returning to the camp they were attacked by natives, who had followed us evidently at a distance, and a spear pierced the leader's arm. At the sound of their firearms the party hurried

to their assistance, and pursued the blacks for some distance, who, however, were soon lost in the dense growth on the other side of the creek. The spear being extracted, and the wound dressed, we continued in the same direction, and reached, after about two miles, a tidal creek about 20 yards wide. Luckily for us it was low tide, and we were therefore able to cross easily, the banks showing that at high tide there was more than twelve feet of water. From here we went for about four miles over open forest-country, and camped on the edge of a flat, on a short allowance of water. After the camp was formed, the leader, myself, and two other members of the party, accompanied by two of the blacks, followed the flat down in a north-easterly direction for about a mile, when we discovered a clear spring in a pandanus thicket, which we named "The Rose." The blacks soon brought the coolies down, and all the water-bags were replenished. After a quiet night the water-bottles were filled again, and we started on a north-north-westerly course for about two miles when we came to a large creek fringed with mangroves. Following this for about three-fourths of a mile in a south-south-westerly direction, a narrow part of the creek was reached, where a couple of trees were felled, over which we crossed to the other side. A quarter of a mile westerly brought us to a salt-water river about 50 yards wide, which forced us to alter our course to north-west. We travelled in this direction for about three miles over a high sandy flat, and camped for dinner with a short allowance of water.

After a rest we continued our trip in a north-easterly direction, over ridges covered with ironstone boulders, the intense heat and scarcity of water making this sort of travelling most unpleasant. After going about three miles we struck a pandanus-flat, and following this down in a north-westerly direction for about a mile we discovered a beautiful strong-running freshwater stream, which was named the "Bath." A swim in the cool water and a copious drink revived the party wonderfully, and after filling our waterbags we pushed on for a couple of miles more, and camped for the night on a high ironstone ridge.

On the 11th October a paperbark swamp was encountered shortly after starting, which forced us to alter our course to north-east, and after a mile's travel the sea was at last sighted. A large swamp, however, blocked our way; and here the first plant new to me—*Lycopodium cernuum*—was found. There was no chance to avoid this swamp, so we had to cross it, travelling for about a quarter of a mile, sometimes up to our belts in black mud. The course was continued in a north-easterly direction for half a mile, when a large river, which was called the "Johnson," was seen running on our left, going east. Pushed on for about two miles to

the south-south-west, following an open swamp; crossed, and camped for dinner.

After this a tramp of hardly a mile brought us to the south of Brenton Bay. As our destination was Lethbridge Bay, fifteen miles to the west, we pushed ahead on the sandy sea-beach till late in the afternoon, when we camped. Water was fortunately found in a sandy hollow after digging about three feet, and we passed the night undisturbed.

The next morning an early start was again made, and we expected to see the ship about 10 a.m. However, after a tramp of nine miles we encountered a large inlet of the sea not marked on the map, which was named "Robinson's Inlet," which stopped our further travel. A raft of dry wood and bushes was soon made, and four of our best swimmers placing their clothes and weapons on this raft, crossed over to the other side with instructions to signal the vessel. After a short while they returned, however, with a native canoe, which they had found, and which enabled those members of the party who were not good swimmers to cross to the other side. A tramp of about two miles brought the Bright-Red Cliffs in Lethbridge Bay in our view, and shortly after the s.s. Active was also seen awaiting our coming.

The country around Lethbridge Bay was dotted with signal-fires, and showed that the natives had watched the movements of the vessel round the coast, and intended evidently to oppose a landing on their island with all their might. While waiting on the beach for the Active's boats, the natives managed to crawl through the bush near enough to give us as a parting salute a shower of spears, which, however, although they fell into our midst, did no harm.

The most prominent feature botanically observed on Melville Island is the fact that no bamboos at all were met with, and the fact that the spears of the inhabitants, which were thrown at us, were made of thin mangrove stems and stringybark would almost prove their absence on the island. A botanical novelty which I would have liked very much to have taken with me was found in the shape of a *Livistona humilis* with four distinct branches.

The list of plants observed during the trip is far from complete, as the hurried way in which I had to make my observations enabled me only to see the more prominent plants, particularly trees, besides which, the season being so advanced most grasses and herbaceous plants were made already unrecognisable. No orchids whatever were observed, and, with the exception of the *Lycopodium cernuum*, no plant which I had not previously collected on the mainland.

ENUMERATION OF PLANTS OBSERVED ON MELVILLE ISLAND.

RANUNCULACEÆ :—*Clematis glycinoides*, De Cand.

NYMPHAEACEÆ :—*Nymphaea stellata*, Willd.

ANONACEÆ :—*Uvaria Holtzei*, F. v. M.; *Polyalthia Holtzeana*, F. v. M.

MYRISTICEÆ :—*Myristica insipida*, R. Br.

MENISPERMEÆ :—*Stephania hernandifolia*, Walpers.

CAPPARIDEÆ :—*Capparis umbonata*, Lindl.

FLACOURTIEÆ :—*Cochlospermum Fraseri*, Planch.

PITTOSPOREÆ :—*Pittosporum melanospermum*, F. v. M.

DROSERACEÆ :—*Drosera petiolaris*, R. Br.

GUTTIFERÆ :—*Calophyllum Soulattri*, Burmann.

MELIACEÆ :—*Dysoxylum Schultzii*, C. De Cand; *Carapa Moluccensis*, Lamark.

RUTACEÆ :—*Xanthoxylum parviflorum*, Benth.

MALVACEÆ :—*Sida rhombifolia*, Linne; *Hibiscus tiliaceus*, Linne; *Hibiscus cannabinus*, Linne; *Thespesia populnea*, Solander; *Bombax Malabarica*, De Cand.

STERCULIACEÆ :—*Sterculia quadrifida*, R. Br.; *Brachychiton paradoxus*, Schott; *Helicteres Isora*, Linne; *Melochia corchorifolia*, Linne; *Elaeocarpus Arnhemicus*, F. v. M.

EUPHORBIACEÆ :—*Petalostigma quadriloculare*, F. v. M.; *Hemicyclia lasiogyna*, F. v. M.; *Croton Verreauxii*, Baillon.

URTICACEÆ :—*Tremna cannabina*, Loureiro; *Ficus scabra*, G. Forster; *F. glomerata*, Willdenow; *Antiaris macrophylla*, R. Br.

CASUARINEÆ :—*Casuarina equisetifolia*, R. and G. Forst.

BURSERACEÆ :—*Canarium Australianum*, F. v. M.; *Ganophyllum falcatum*, Blume.

ANACARDIACEÆ :—*Buchanania obovata*, Engler.

AMARANTACEÆ :—*Gomphrena canescens*, R. Br.; *Amaranthus leptostachyus*, Benth.

LEGUMINOSÆ :—*Jacksonia dilatata*, Benth.; *Psoralea Testariæ*, F. v. M.; *Indigofera hirsuta*, Linne; *Canavalia obtusifolia*, De Cand.; *Abrus precatorius*, Linne; *Pongamia glabra*, Ventenat; *Caesalpina Bonducella*, Fleming; *Peltophorum ferrugineum*, Benth.; *Erythrophlaeum Laboucherii*, F. v. M.; *Acacia praelongata*, F. v. M.; *A. drepranocarpa*, F. v. M.; *A. auriculiformis*, Cunning.; *A. latifolia*, Benth.; *Albizzia procera*, Benth.; *A. monilifera*, F. v. M.

ONAGREÆ :—*Jussieua suffruticosa*, Linne.

SALICARIEÆ :—*Pemphis acidula*, R. and G. Forst.

RHIZOPHOREÆ :—*Rhizophora mucronata*, Lamark.; *Ceriops Candolleana*, Arnott.

MYRTACEÆ :—*Verticordia Cunninghamii*, Schauer.; *Calycothrix microphylla*, A. Cunn.; *Melaleuca Leucadendra*, Linne.;

M. symphyocarpa, F. v. M.; *Eucalyptus miniata*, A. Cunn.; *E. clavigera*, A. Cunning.; *E. alba*, Reinwardt.; *E. tetradonta*, F. v. M.; *Metrosideros paradoxa*, F. v. M.; *Eugenia Armstrongii*, Benth.; *E. Holtzeana*, F. v. M.; *Barringtonia acutangula*, Gaertner.; *Careya australis*, F. v. M.; *Sonneratia acida*, Linne fil.

MELASTOMACEÆ :—*Osbeckia Australiana*, Naudin.; *Melastoma Malabathricum*, Linne.

RHAMNACEÆ :—*Zizyphus Oenoplia*, Miller; *Alphitonia excelsa*, Reisseck.

VINIFERÆ :—*Vitis adnata*, Wallich; *V. acetosa*, F. v. M.

LEEACEÆ :—*Leea Brunoniana*, Clarke.

UMBELLIFERÆ :—*Didiscus villosus*, F. v. M.

OLACINEÆ :—*Ximenia Americana*, Linne.

LORANTHACEÆ :—*Loranthus longiflorus*, Desrous.

PROTEACEÆ :—*Persoonia falcata*, R. Br.; *Grevillea Chrysodendron*, R. Brown; *G. heliosperma*, R. Brown; *G. Dryandri*, R. Brown; *G. mimosoides*, R. Brown; *Hakea arborescens*, R. Brown; *Banksia dentata*, Linne fil.

RUBIACEÆ :—*Sarcocephalus cordatus*, Miquel; *Gardenia megasperma*, F. v. M.; *Ixora Dallachyana*, F. v. M.; *Timonius Rumphii*, De Cand.; *Guettarda speciosa*, Linne; *Morinda citrifolia*, Linne.

PASSIFLOREÆ :—*Modecca australis*, R. Brown.

CUCURBITACEÆ :—*Trichosanthes Holtzei*, F. v. M.; *Luffa foetida*, Cavanilles.

COMPOSITÆ :—*Pleurocarpaea denticulata*, Bentham; *Brachycome iberidifolia*, Bentham; *Vittadinia macrorrhiza*, A. Gray; *Helichrysum lucidum*, Henckel.

GOODENIACEÆ :—*Scaevola Koenigii*, Vahl.; *Goodenia Armitiana*, F. v. M.

GENTIANEÆ :—*Limnanthemum Moonii*, Thwaites.

LOGANIACEÆ :—*Strychnos lucida*, R. Brown.

MYRSINACEÆ :—*Aegiceras majus*, Gaertner.

SAPOTACEÆ :—*Mimusops parvifolia*, R. Brown.

EBENACEÆ :—*Diospyros cordifolia*, Roxburgh.

JASMINEÆ :—*Jasminum didymum*, G. Forster; *J. simplicifolium*, G. Forster.

APOCYNEÆ :—*Alstonia verticillosa*, F. v. M.; *Wrightia saligna*, F. v. M.; *Parsonia velutina*, R. Br.

ASCLEPIADEÆ : — *Sarcostemma australe*, R. Br.; *Marsdenia velutina*, R. Br.

CONVOLVULACEÆ :—*Ipomoea Turpethum*, R. Br.; *I. Pes Capræ*, Roth.; *I. graminea*, R. Br.; *Evolvulus linifolia*, Linne; *Cressa Cretica*, Linne.

SOLANACEÆ :—*Solanum viride*, Solander.

Scrophularinæ :—*Mimulus Uvedaliæ*, Benth.
Lentibularinæ :—*Utricularia chrysantha*, R. Brown ; *U. cyanea*, R. Brown ; *U. leptoplectra*, F. v. M.; *U. Singeriana*.
Bignoniaceæ :—*Dolichandrone filiformis*, Seemann.
Acanthaceæ :—*Thunbergia fragrans*, J. Koenig ; *Acanthus ilicifolius*, Linne ; *Hypoestes floribunda*, R. Brown.
Labiatæ :—*Coleus scutellarioides*, Benth.; *Pogostemon verticillatus*, Hasskarl ; *Anisomeles salvifolia*, R. Brown.
Verbenaceæ :—*Clerodendrum floribundum*, R. Brown ; *C. Holtzei*, F. v. M.; *Gmelina macrophylla*, Benth ; *Vitex glabrata*, R. Brown ; *Avicennia officinalis*, Linne.
Asperifoliæ :—*Cordia subcordata*, Lamarck.
Cycadeæ :—*Cycas media*, R. Brown.
Taccaceæ :—*Tacca pinnatifida*, R. and G. Forster.
Heamodoraceæ :—*Haemodorum subvirens*, F. v. M.
Dioscorideæ :—*Dioscorea transversa*, R. Brown.
Liliaceæ :—*Smilax australis*, R. Brown ; *Asparagus racemosus*, Willd. ; *Dracaena angustifolia*, Roxb.
Palmæ :—*Livistona humilis*, R. Br.
Pandaneæ :—*Pandanus odoratissimus*, Linne f.
Aroideæ :—*Amorphophallus variabilis*, Blume.
Typhaceæ :—*Typha angustifolia*, Linne.
Pontederiaceæ :—*Monochoria cyanea*, F. v. M.
Philhydreæ :—*Philhydrum lanuginosum*, Banks.
Flagellariaceæ :—*Flagellaria Indica*, Linne.
Cyperaceæ :—*Cyperus decompositus*, F. v. M.
Gramineæ :—*Panicum semialatum*, R. Brown ; *Setaria glauca*, Palisot ; *Spinifex longifolius*, R. Brown ; *Imperata arundinacea*, Cyrillo ; *Andropogon exaltatus*, R. Brown ; *A. contortus*, Linne ; *Arundo Roxburghii*, F. v. M.
Lycopodinæ :—*Lycopodium cernuum*, Linne.
Filices :—*Lygodium scandens*, Swartz ; *Gleichenia flabellata*, R. Brown ; *Adiantum lunulatum*, Burmann ; *Cheilanthes vellea*, F. v. M. ; *Aspidium exaltatum*, Swartz ; *Polypodium phymatodes*, Linne ; *P. quercifolium*, Linne ; *Acrostichum scandens*, J. Smith ; *A. aureum*, Linne.

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Some Habits and Customs of the Chingalee Tribe, Northern Territory, S.A.

By A. G. B. Ravenscroft.

(Communicated by E. C. Stirling, M.D.)

[Read July 5, 1892.]

Locality.—The Chingalee Tribe occupy a large area of country of which Charlotte Waters is the centre; extending northward 96 miles to Daly Waters; southwards 60 miles to Powell's Creek; eastwards 100 miles; and westwards 70 miles.

Water-supply.—These aboriginals are by no means solely dependent upon the creeks for their water-supply, as they have shallow wells in various parts of the scrub, 12 and 15 miles distant from the water-courses. One of these native wells is remarkable as regards its construction, being sunk vertically for eight feet, and then a drive was run for six feet. These natives do not appear to be particular as to the purity of their drinking water, and camp by preference at their wells, in which the water is generally more or less tainted, instead of at water-holes. Also the water contained in their wooden vessels often fairly stinks, owing to their habit of putting leaves in it to prevent its spilling, and then neglecting to remove them. This causes a fermentation to be set up, which renders the water quite unsuitable to a thirsty European. The water in the wells is generally of an inky colour, and gives the impression of being contaminated with sewage.

Religion.—The idea of a Supreme or any other Supernatural Being does not appear to exist. Neither is there any conception of a hereafter; for, when asked what becomes of them after death, the invariable reply is "all along same dingo." It may be stated, however, that amongst the Dawson blacks of Queensland there is current a kind of "Adam and Eve" story to the effect that long ago blacks of both sexes lived in the sky, who were let down on the earth to play during the day; and taken up again at sunset. On one occasion a blackfellow and his lubra were left behind, and after this the others never again visited the earth. From this pair the blacks of the Dawson River were said to be descended.

Customs.—Circumcision is generally practised. Two per cent. of the males have also the urethral canal laid open. This latter operation consists in making on the underside of the penis an incision into the canal extending from the base to the orifice. The cut is then plugged with clay until healed. At the age of ten years the boys are circumcised; but the severer operation is only

performed at a more advanced period of life. The natives firmly believe that the operation on the urethra prevents the possibility of procreation. My observations here during the past five years have supported this view; although, on the other hand, it has come to my knowledge that the lubras of natives of other tribes so operated upon have borne children. These blackfellows, however, always deny the paternity, and, referring to the child, assert, "That one belong another blackfellow; me no get 'um piccaninny." The women are operated upon when about nine years of age with a stone knife, but the nature of the operation is obscure, although it mutilates them much. The idea here, also, is that it prevents procreation, and as far as my observations go, such lubras have never conceived. There is another custom of a revolting nature which may be mentioned, and which I have investigated with considerable trouble. Old men are often noticed with no lubras, but accompanied by one or two boys, whom they jealously guard. The impression conveyed at first to my mind was that the men were suffering from a form of *proctorexia;* but this proved to be incorrect upon questioning a communicative and intelligent boy belonging to one of these old men, whose statements have since been corroborated. By words and gestures the boy was made to understand what I thought. He laughed and shook his head, and proceeded by a suggestive pantomime to illustrate what took place. The old man, when he wished to indulge in the vice, would lie down by the fire and beckon a boy to him, and place him in a sitting posture in front. Judging from the amount of energy displayed by the boy in his description, which he illustrated by an occasional spit on the hand, the requisite excitation must be a laborious process. Upon my suggesting that the boy was only romancing, he at once exhibited an indignation at the idea of his word being doubted more virtuous than the language in which it was expressed.

Superstition.—During my stay in the Newcastle Waters country I found the blacks had a curious superstition connected with some pieces of crystallized quartz. Coming upon a camp one day, I began to examine its contents, and found a large bundle of "paper-bark." On unrolling it I found parcel inside parcel until I came to a very small one containing four or five pieces of crystallized quartz. Taking these back to the station, I inquired the use of them, and the blacks told me they were called Mowija, and were used to kill an enemy by creeping up to him when asleep and touching him on the chest with the quartz, after which he was certain to die. Taking the stone to the camp, I pretended to touch the men with it, which made them look terribly frightened and run as if for their lives. I then drew a piece across my own chest, and there was a general cry of genuine horror.

Notes on Glacial Phenomena about Mount Gambier.

By P. H. Priestley

(Communicated by Prof. Tate).

[Read September 6, 1892.]

Abridged.

One of the most striking and persistent geological features is a stratum of sand, which overlies the limestone of the district. Round Naracoorte are sand-dunes sometimes attaining thirty and forty feet high; these continue intermittently along the high ground through Penola to Mount Gambier. This tract seems to be the watershed of the South-East; spreading away to the west are the Mosquito Plains and the swampy lands of Lucindale and Millicent; on the east are sandy ridges and small sandy flats which stretch disjointedly to the western districts of Victoria. On the western side sand is not so frequent, although great patches occur, as from Mount Gambier to Tantanoola; on the south of Mount Gambier the watershed terminates, and slopes to the sea.

The origin of this sand is not so clear as would appear at first sight; that it is partly of marine origin is proved by the presence of existing sea-shells in it, as may be gathered by reference to Tenison-Woods' "Notes on the Geology of S. A." It is in the immediate vicinity of Mount Gambier, however, that the clue is to be found.

At any one of the numerous quarries close to Mount Gambier, a number of pot-holes in the limestone may be seen in the face; these vary in width from one to five and six feet, and in depth up to ten feet; they are filled, some with the surrounding soil, others with clay (a greenish-gray predominating), interspersed with angular and rounded rock-fragments of various sizes up to two pounds in weight. The angular fragments have their edges as fresh as when first broken off the parent rock, and the rounded ones present the appearance of having been well-rolled by water.

Beneath the volcanic-tuff, the sand-layer ranges from a few to eighteen or twenty inches in thickness; it appears, to a great extent, to be angular, although containing a proportion of rounded grains, and at the same time contains a great number of edged fragments weighing up to a quarter of a pound, and rolled pieces of like size; when sufficiently thick, as at an old well about two

miles west of Mount Gambier, on the right of the road to Millicent, where it is five feet, false-bedding is seen. I have failed to discover any striated stones or animal remains in it; though roots and partially-decayed vegetable matter are common; the vegetation, which grew on this surface, was destroyed by the showers of volcanic ash, and the remains of *Banksias*, &c., are not infrequent in the lowest stratum of volcanic tuff.

On removing the sand from the underlying limestone, its surface is seen to be as smooth as a coarse limestone can be; and is in strong contrast with a weathered face of the same stone. The conclusion is irresistible that the whole has been ground down by some hard substance. Ice?

The leading surface-feature, as viewed from the summit of the Mount, is seen to be the presence of a number of irregularly-placed low hills, running in no definite direction, no cliffs, no valleys. These are hills of denudation, and in most cases are constituted of Woods' "Upper Crag," and the quarries in the lower ground are chiefly in his "Coralline Crag." Their formation cannot be due to rain, because of the smoothness of the surface where protected from weathering influences; or to running water, as the slope of the ground, which is only about one to two hundred feet in sixty miles, would not be sufficient to create a rapid flow, were such a body of water possible.

The phenomena, which cannot be satisfactorily explained without the aid of *Ice*, are (1) the angular and rounded stones in the sand-bed; (2) the pot-holes; (3) the smoothed surface of the underlying limestone; and (4) the rounded outline of the hills.

With regard to the thickness of the ice-cover, there is little to guide one in forming an opinion; the small quantity of detritus may indicate a thick sheet, and the small size of the pot-holes suggests rapidly-moving ice, whilst the depth of denudation points perhaps to a thick ice-sheet, or at any rate to long-continued action. All strata of a later date than Woods' "Upper Crag" have been removed, and in some places his "Coralline Crag" has been denuded to a depth of twenty-five or thirty feet at least.

Descriptions of some New Species of Marine Mollusca from Australia.

By Professor Ralph Tate, F.L.S., F.G.S.

[Read September 6, 1892.]

Plate I.

Voluta Verconis, *spec. nov.* Pl. i., fig. 5.

Elongate-fusiform, spire turrited, short; aperture about two-thirds the total length.

Pullus hemispheric of two and a half smooth whorls; spire-whorls three and a half, the anterior ones angulated antemedially and nodosely-plicate on the angulation, extending to the anterior suture, but evanescent towards the posterior suture. Body-whorl with ten nodosities on the periphery, abruptly terminating plications, which occupy the median area; at about the anterior-fourth the suture commences to ascend on the penultimate whorl, finally attaining to the angulation; outer lip incrassated, but bevelled-off inside to a thin simple edge; columella with four plications.

The sculpture consists of axial linear grooves, hardly visible by the unaided eye, and transverse wavy-striæ; the latter occur on the spire-whorls and the shoulder of the body-whorl, and are visible only by the aid of a lense.

The colour is whitish, with intricate-linear fulvous markings; chesnut spotted around the posterior suture, and on the body-whorl also about midway between the angulation and the front.

Dimensions of two adult specimens in millimetres:—

	(1)	(2)	Mean ratio.
Total length ...	28	23·5	100
Length of aperture	18·5	15·5	66
Greatest width ...	11	9	38

Habitat.—Two adult specimens, as shown by the incrassation of the lip and its ascension on the spire, were taken alive by Dr. Verco, from 13 fathoms in Yankalilla Bay, St. Vincent Gulf; and a living adolescent example from 30 fathoms off Corney Point, Spencer Gulf. Two dead shells dredged in Investigator's Straits (*Zietz*, in S. Aust. Mus.); also one dead shell in 22 fathoms by Dr. Verco.

Affinity.—In its general characters this new species resembles a dwarf *V. Kreuslerœ*, Angas, being about one-third its size; from which it differs by its proportionately shorter spire (the ratio of

the total length to that of aperture in *V. Kreuslerœ* is 100 to 62), more angulated whorls, by the ascension of the anterior part of the body-whorl on the spire, and by its wavy-striated surface. The last character, which it has in common with *Voluta (Volutoconus) coniformis*, Cox, is very exceptional in the genus.

Columbella cominellæformis, *spec. nov.* Pl. i., fig. 8.

Shell elongately oval, moderately solid, shining, unicolorous (pellucid-white, rose, or purplish-brown); apex somewhat apiculate; pullus semicylindrical of two smooth whorls, the first very small, the second narrow and elongate. Spire-whorls four, strongly nodulose-plicate (nine or ten on the penultimate), spirally distantly linear-sulcate, and striated transversely; the two posterior whorls are subangulated.

The body-whorl has about two plications in its posterior part, which become evanescent in an alignment with the hinder angle of the aperture; the rest of the surface is without ornament, but is sculptured with striæ of growth and incised spiral lines, the latter passing into sulci separating depressed narrow ridges on the base.

Aperture narrowly subquadrate; canal short, everted; the outer lip has a blunt edge. The medial part of the body-whorl behind the aperture is slightly compressed and there is a slight tabulation at the suture, which produce a slight insinuation at the posterior angle of the aperture.

Dimensions.—Length, 10; breadth, 4·25; length of aperture, 5 mm.

Localities.—I have collected about a dozen examples in as many years, extending from Fowler Bay, St. Vincent Gulf, Cape Northumberland to Victoria.

This species has much the same build as *C. Smithii*, Angas, and *C. atrata*, Gould, but it is conspicuously different by its smooth body-whorl and nodulose plicæ, and is moreover a much larger shell.

Turbonilla crenulifera, *spec. nov.* Pl. i., fig. 2.

Shell elongately cylindrical, thin, translucent-white, regularly axially ribbed, without spiral sculpture; the ribs are slightly arched, broad, and are continued backwards as crenatures on the very narrow obtuse shoulder of the whorl.

Whorls, excepting the apical ones, six; the pullus is heterostrophe, with the apex transverse and exsert. The axial plicæ decrease in strength as they approach the anterior suture, and on the last whorl are almost obsolete. The aperture is quadrately oval, the columella has an inconspicuous fold.

This species has much the aspect of a *Parthenia*.

Dimensions.—Length, 5; breadth, 1·25 mm.

Localities.—Streaky and Fowler Bays in the Great Australian Bight.*

Ectorisma, *gen. nov.*

Etymology.—*Ectos*, outside; *ereisma*, support; having reference to the external ligament.

Type.—Ectorisma granulata, *spec. nov.*

Shell oval, thin, transparent, equivalve, inequilateral, slightly nacreous within; valves gaping behind; surface granulated.

Right valve with a small cuneiform cardinal tooth. Left valve, with an obsolete socket beneath the umbo; the posterior and anterior margins of the hinge-line, where overlapped by the right valve, simulate ridge-like lateral teeth, the development on the posterior side being very pronounced, whilst it is somewhat obsolete anteriorly. Ligament external, supported in the anterior part by a linear-lanceolate extension of the hinge-line.

Mantle open in front, mantle-margin without distinct sinus; siphons united, very short, encircled with cirri; foot conical.

This genus by its external ligament, thin and granulated test, and its gaping valves, is closely allied to *Pholadomya*; from *Neæromya* it differs by its dentition and closed valves. It has certain resemblances to *Poromya*, *Cryptomya*, and other related genera having an internal cartilage.

Ectorisma granulata, *sp. nov.* Pl. i., figs. 3, 3a.

Shell inequilateral, transversely oval-oblong, ventricose; anterior side rounded; posterior side longer, with a narrowed subtruncated margin; posterior margin slightly spreading to form a gape, 2 mm. at the widest, and about 6 mm. in length.

The umbos are large, transverse, approximate. Surface of valves ornamented with granules arranged in radial rows, the granulation is, however, more or less absent in the umbonal region, which is of a pearly lustre externally. There are 15 cirri surrounding the base of the united siphons.

Dimensions.—Antero-posterior, 15; umbo-ventral, 11; sectional diameter, 7·5 millimetres.

Locality.—Hardwicke Bay, Spencer Gulf; two living specimens dredged from 8 to 10 fathoms by Dr. Verco.

Genus Mysella.

Mr. E. A. Smith, in Annals and Mag. of Nat. Hist., 1891, p. 235, suppresses this genus by including it under *Tellimya*, Brown (usually regarded as a section of *Montacuta*); and at the

* Tasmanian examples have boen submitted to me by Rev. H. T. Hull, who considers it identical with *Chemnitzia Beddomei*, Petterd.

same time overlooks the fact that I had already in 1887 * transferred the genus to the vicinity of *Montacuta*. Nevertheless, I am of the opinion that the details of the dentition are not identical in the two, and that *Mysella* should be retained.

The left valve has a relatively large, diverging, flattened tooth posterior to the triangular cartilage-pit; the anterior margin of the pit is thickened and margined to simulate a transverse tooth; in front of this is a small socket.

The right valve has the hinge-margin on each side of the umbo produced, which is overlapped by the hinge-line of the opposite valve; the posterior tooth-like edge interlocks above the cardinal tooth of the left valve, and the anterior, which is shorter, is received in the socket in front of the ridge-like edge of the cartilage-pit. These tooth-like margins of the right valve must be regarded as representing cardinal and not lateral teeth. I have failed to detect any trace of an ossicle, though I am not disposed to attach any particular value to its presence or absence.

Mysella ovalis, *spec. nov.* Plate i., fig. 7.

Shell thin, whitish or pale-horn coloured, pellucid, shining, ornamented with a few concentric ridges and intermediate striæ of growth; equivalve.

Valves transversely oval, sub-equilateral, depressedly convex; hinge-line arched, the anterior slope slightly incurved and shorter than the posterior slope, which is straight; anterior margin inconspicuously truncatedly-rounded, posterior margin more pointed; the ventral margin is moderately curved outwards. Umbos small, acute, approximate, antemedian.

Dimensions.—Antero-posterior diameter, 14·5; umbo-ventral diameter, 10; sectional diameter, 4·25; anterior radius, 6; posterior radius, 8·5.

A larger valve has the following diameters:—Antero-posterior, 15; umbo-ventral, 11·5.

Habitat.—Hardwicke Bay, two examples from ten fathoms, and Investigator Straits near Troubridge, two valves from 22 fathoms *(Dr. Verco)*.

This third species differs from its congeners by its less inequilateral shape and by its rounded ventral margin, but approaches more to *M. anomala* than to *M. donaciformis*.

Lucina perobliqua, *spec. nov.* Plate i., fig. 10.

Shell thick, white, obliquely oval, subventricose, inequilateral; dorsal margin concave in front, nearly straight and rapidly descending behind; posterior margin truncatedly rounded; ven-

* Trans. Roy. Soc., S. Aust., vol. IX., p. 99.

tral margin strongly arched, roundly curving to the anterior margin.

Surface with close-set concentric striæ in the umbonal region gradually becoming linear sulci with increasing growth; towards the front margin the flat ridges do not exceed ·5 mm. wide, but they are somewhat unequal in width. The anterior and posterior slopes are ornamented with narrow, slender, minutely crenulated, radial threads; the medial area is, however, obscurely radiately-lined. The right valve has two cardinal teeth and a lateral on each side, the left valve has one cardinal tooth and two laterals on each side.

Dimensions of a large example.—Antero-posterior diameter, 28; umbo-ventral diameter, 23; sectional diameter, 15 mm.

Habitat.—As a beach-specimens collected in South Yorke-Peninsula by Messrs. Matthews and McDougall. Numerous single valves dredged by Dr. Verco, from 15 and 22 fathoms in Investigator's Straits; and from 30 fathoms off Corney Point, Spencer-Gulf.

Affinities.—This species has been known to me for some years past, but as the condition of the specimens did not permit of detailed definition, it had been regarded tentatively as the senile stage of *L. Tatei*, Angas. Some of the specimens recently obtained by Dr. Verco permit a critical comparison to be made. In outline the new shell is more comparable with *L. obliqua*, Reeve, but that shell is decussated throughout with radial and concentric striæ. *L. Tatei*, which does not much exceed 8 mm. in the umbo-ventral diameter, is ornamented with linear raised concentric lines, with broad intervening furrows, tessellated by conspicuous radial ridges; whilst the umbonal portion of *L. perobliqua*, corresponding in area with a large valve of *L. Tatei*, is marked with close-set concentric striæ, and the lateral borders only with radial threads. As yet no examples of *L. perobliqua* have been obtained so small as the largest *L. Tatei*, but the smallest of them show an obliquity which is not presented by the latter.

Lucina paupera, *spec. nov.* Pl. i., fig. 6.

Shell quadrately- and somewhat obliquely- oval, equivalve, very inequilateral, solid, dirty-white, very finely ridged concentrically; the concentric ridges very thin, inconspicuously elevated and distant, the interstices smooth; at about three-fourths to the front they become closer together and thicker; there is no trace of radial ornamentation.

The antero-dorsal margin is nearly straight, and rapidly descending; the post-dorsal margin is arched, and abruptly joins the much-rounded posterior margin; ventral margin considerably arched.

Umbones acute, incurved, approximate; the lunule is broadly lanceolate and shallow, each valve equally contributing to its formation; escutcheon very narrow and slightly depressed, with subangular margins.

Right valve with a cardinal tooth and an anterior lateral tooth; the posterior lateral is imperfectly developed. Left valve with two divergent cardinal teeth; there are no laterals. Inner margin of valves plain.

Dimensions.—Antero-posterior diameter, 11; anterior radius, 6·5; posterior radius, 4·5; umbo-ventral diameter, 10; sectional diameter, 6 mills.

Habitat.—Three miles off Rickaby, Hardwicke Bay, Spencer Gulf, in eight fathoms. One perfect shell *(Dr. Verco)*.

This new species has much the outline of *L. quadrata*, Angas, though with a less arched antero-dorsal margin. The concentric ornamentation, the great inequilateral form and the simple dentition are associated characters, which give distinctness to this species.

Cardita gemmulifera, *spec. nov.* Pl. i., fig. 9.

A single living specimen of a *Cardita* taken in company with *C. Beddomei*, in 17½ fathoms off Corney Point by Dr. Verco, differs sufficiently from that species to justify a distinctive denomination. The costæ are ornamented with close-set rounded tubercles in place of narrow tranverse ones, and the sectional outline of the shell is slightly more tumid.

Dimensions.—Antero-posterio, 10; umbo-ventral, 9; sectional diameter, 6·75 mm.

Lithodomus projectans, *spec. nov.* Pl. i., fig. 1.

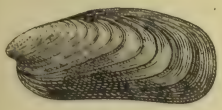
Shell cylindrical-oblong; umbones tumid, involute, projecting beyond the anterior margin; somewhat narrowed posteriorly, without angulation, to the roundly-truncated margin; anterior margin rounded; post-dorsal margin strongly arched; ventral margin nearly straight, but slightly curved antemedially.

Test covered with a reddish-brown, thick, glossy epidermis, marked with a few linear sulci which pass into abrupt subimbricating folds on the posterior slope. Interior of a violet-brown colour.

Dimensions.—Antero-posterior diameter, 28; greatest transverse diameter, 12·5; sectional diameter, 12 (vix.).

Locality.—Port Darwin *(W. T. Bednall)*.

This species is conspicuous by its projecting umbos and strongly arched dorsal line, in which particulars it resembles *L. cinnamoneus*, Chemnitz, from which it differs by its less arched dorsal line, straighter ventral margin and by the *absence* of *decussated sculpture*. It is referred to under *L. brevis*, Tate, Trans. Roy.



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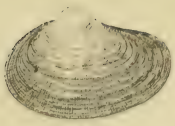

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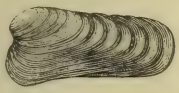

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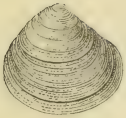

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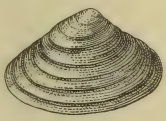

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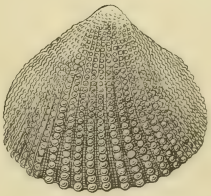

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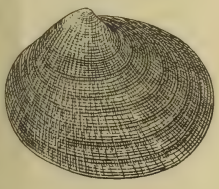

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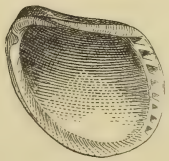


11a

H.B. lith.

HUSSEY & GILLINGHAM, LITH

Soc., S. Aust., 1887, p. 186, as a near alliance to that fossil-species.

Lithodomus cuneiformis, *spec. nov.* Pl. i., fig. 4.

Shell cuneately-oblong, without any posterior angulation, widest near front, attenuating rapidly to the narrow truncated and thickened margin; anterior side very short, truncatedly-rounded; ventral margin nearly straight, but slightly incurved about the byssal region and corresponding with an almost imperceptible depressed area, which descends with a backward inclination from the umbo. Umbos large, tumid, involute, approximate, nearly terminal, but not protruding beyond the vertical plane of the anterior margin.

Test, which is covered with a thick, brown, glossy epidermis, is marked with somewhat distant furrows, becoming on the posterior slope very prominent and subimbricate; the surface is otherwise smooth and without sculpture.

Dimensions.—Antero-posterior diameter, 17; umbro-ventral diameter, 8; sectional diameter through the umbos, 7.

Habitat.—Occupying crypts in a friable consolidated shell-ooze in eight fathoms, two miles off Port Victoria, St. Vincent Gulf; many examples *(Dr. Verco).*

This is a very distinct species on account of its shape and absence of radial sculpture, unless it may prove to be *Modiola pulex*, Lamarck, of King George Sound; the diagnosis of which is, however, so brief as not to be satisfactorily applicable to it.

Myrina crenatulifera, *spec. nov.* Pl. i., figs. 11, 11a.

Test rather thick, moderately inflated, obliquely truncate-oval very inequilateral, equivalve; covered with a thin, brown, glossy epidermis, which is raised into slender folds of growth. The umbones are prominent, inflated, approximate, incline-over towards the front, and are nearly terminal. The anterior outline is oblique, narrowly and regularly arcuate, interrupted only beneath the hinge-extremity by an inconspicuous byssal-sinus; the posterior side is more arched and regularly rounded to the obliquely semicircular ventral margin; the dorsal outline is straight. The hinge-line is broad, transversely plicated at both ends, the plications being interrupted by a ligamental groove, which descends obliquely from the umbo; there are about twenty plications on the anterior side, and about thirty posteriorly.

The interior is bluish-brown, and glossy, with a paler or white clouding circumferentially. The edge of the valves is slightly thickened, particularly in the post-dorsal margin, which is furnished with from four to six tooth-like crenatures—the terminations of radial ridges.

Dimensions.—Antero-posterior diameter, 2 mm.; dorsal-ventral diameter, 2 mm.; sectional diameter, 1·5 mm.

Locality.—In shell-sand, MacDonnell Bay; several examples *(Mr. A. Adcock).*

This little shell has rather the external form of *Crenella* than of *Myrina*, but as the ligamental pit is wholly excavated in the hinge, and not descending underneath it, as in the former, I refer it to the latter genus, which has hitherto been known in Australian waters only by one species—*M. Coppingeri*, E. A. Smith, Challenger Rep., from east of Cape York, in 1,400 fathoms.

EXPLANATION OF PLATE I.

Fig.
1. Lithodomus projectans. Nat. size.
2. Turbonilla crenulifera. Enlarged 5 x.
3. Ectorisma granulata. Left valve slightly enlarged.
3a. Ectorisma granulata. Side view of hinge of right valve.
4. Lithodomus cuneiformis. Slightly enlarged.
5. Voluta Verconis. Slightly enlarged.
6. Lucina paupera. Slightly enlarged.
7. Mysella ovalis. Slightly enlarged.
8. Columbella cominellæformis. Enlarged 2 x.
9. Cardita gemmulifera. Enlarged 2·5 x.
10. Lucina perobliqua. Nat. size.
11. Myrina crenatulifera. Right valve, exterior, enlarged 8 x.
11a. Myrina crenatulifera. Right valve, interior, enlarged 8 x.

A Third Supplement to a List of the Lamellibranch and Palliobranch Mollusca of South Australia.

By Professor Ralph Tate, F.L.S., F.G.S.

[Read September 6, 1892.]

Some Lamarckian species said to have been collected in South Australian waters have up to the present remained unrediscovered; whilst it is not improbable that the recorded localities are correct, yet because of the known distribution of the species there are grave doubts as to the accuracy of the record.

Tellina virgata, *Lin.; Lamarck*, An. s. V., vol. V., p. 521,, gives the Indian Ocean as the habitat; but Bertin, in his Monograph of the Tellines, states that Lamarck's specimens were collected in 1801 by Peron and Lesuer at St. Pierre and St. Francois Isles.

Tellina staurella, *Lamarck*, with the habitat "seas of New Holland." Bertin says that the types of *variety C.* were collected by Peron and Lesuer at Kangaroo Island, and at St. Pierre and St. Francois Isles.

The above species are known as inhabitants of the Indo-Pacific region reaching the northern shores of Australia, and there are no records of their occurrence in the temperate seas of Australia other than those above quoted.

Crassatella Lamarckii, *Nyst.*, Bull. Acad. Roy. de Belgique, 1846.

Syn.—Crassatella sulcata, *Lamarck*, varieties *a*, *c*, An. s. V., vol. V., p. 481 (non Solander). ? Crassatella sulcata, *Reeve*, Icon. Conch., t. 2, fig. 6.

The type specimens of Lamarck's *var. c* are from Kangaroo Island; the other from "La baie des Chien marins."

According to some authors, *Crassatella pulchra*, Reeve, and not *C. sulcata*, Reeve, represents the Lamarckian species, in which case it is not improbable that *C. Kingicola*, Lamk., may include it. However, I have no authentic record of that species for South Australia, though its occurrence in Port Philip Bay and Bass-Straits and on the East coast is well assured.

Some additional species of *Kellia* and allied genera, which have been collected by Mr. A. Adcock in South Australian waters, have reached me too late for inclusion in this communication.

Addenda and corrigenda to previously recorded species are placed within brackets.

[**Clavagella multangularis,** *Tate.*

Aspergillum (Humphreyia) multangulare proves to have the right valve free within the adherent disk, and is therefore transferred to *Clavagella.*

Dr. Verco has dredged it in Hardwicke Bay.

Ectorisma granulata, *Tate, antea,* p. 127.

Hardwicke Bay.

Naranio rubiginosa, *A. Adams and Angas.*

Ref.—Proc. Zool. Soc., 1863, p. 425, t. 37, fig. 17.

This species differs from *N. divaricata* by its thin delicate test, regular ovate-oblong and ventricose form, and finer divaricate sculpture; in consequence of the last character, the surface is iridescent when viewed by sun-light.

The colour of the South Australian examples is pellucid-white with a pale-pink suffusion in the umbonal regions extending in rays, especially on the posterior side. The largest example, which is smaller than the type, has the following dimensions:—Antero-posterior, 13; umbro-ventral, 10; and sectional diameters, 7 millimetres.

The habitat of the two species is moreover different; *N. divaricata* lives in rocky cranies, whilst *N. rubiginosa* burrows in ooze. The original record is "Port Jackson, four fathoms, enclosed in a nodule of clay;" I do not know if it has been re-taken.

Localities.—Aldinga Bay, very rare and small, in shell-sand *(R.T.).* Dredged in Hardwicke Bay, Spencer Gulf, from eight to ten fathoms, four perfect shells, and five single valves *(Dr. Verco).*

Lucina perobliqua, *Tate, antea,* p. 128.

Investigator's Straits and Southern Yorke-Peninsula.

Lucina paupera, *Tate, antea,* p. 129.

Hardwicke Bay, Spencer-Gulf.

Cardita gemmulifera, *Tate, antea,* p. 130.

Spencer Gulf.

[**Cardita bimaculata,** *Deshayes.*

Ref.—Proc. Zool. Soc., 1852, t. 17, figs., 4-5.

Syn.—*C. Gunnii,* Deshayes, op. cit. p. 101; *C. Atkinsoni,* Ten-Woods, Proc. Roy. Soc., Tasm.

The two species of Deshayes, here quoted, should be regarded as one and the same; the first was attributed to New Zealand, though it is not admitted by Prof. Hutton in his revised list of New Zealand Mollusca, and the second to Tasmania; because of the assumed far-distant localities, the describer may have been induced to attach undue value to individual differences,

which he would not have done had he known that they belonged to the same habitat.

Of the two names *C. bimaculata* is to be preferred because the diagnosis is accompanied by figures.]

[Genus Mylitta, *D'Orbigny and Recluz.*

Our species quoted under *Pythina* should be transferred to the above-named genus; as according to Mr. E. A. Smith, Annals and Mag. Nat. Hist., 1891, p. 227, *Pythina* is restricted to *P. Deshayesiana*, Hinds, and differs from *Kellia* only by its divaricate plications.

Mylitta Deshayesii, *D'Orb. and Recluz.*

Syn.—Pythina Deshayesii, *auctores*; P. Deshayesiana, *Tate*, Trans. Roy. Soc., S. Aust., 1887, non *Hinds.*

Mylitta Tasmanica, *T. Woods*

Syn.—Pythina Tasmanica, *T. Woods*; id., *Tate*, op. cit.

Smith says that this species "is identical with the preceding"; but this I think is a very hastily-formed opinion, and I doubt if he has seen the shell or giving attention to the figure or description of it.

Mylitta gemmata, *Tate.*

Syn.—Pythina gemmata, *Tate*, op. cit.

This species has been obtained in a living state at Edithburgh associated with *Ephippodonta* spp. by Mr. Matthews.]

[**Kellia rotunda,** *Deshayes.* Var., *E. A. Smith*, Challenger Report, t. xi., f. 5.

A single specimen obtained by Mr. Adcock at Hardwicke Bay is larger and less rotund than examples comparable with the types. This variety is figured by Smith, as above quoted, who remarks "the specimens from Bass Strait exhibit a precisely similar outline (to the figured example from Port Jackson), and consequently approach very closely to *K. cycladiformis* of New Zealand; and, indeed, I am rather inclined to believe that they will prove eventually variations of one and the same species."]

Mysella ovalis, *Tate, antea*, p. 128.

Hardwicke Bay and Investigator's Straits.

[**Diplodonta Adamsi,** *Angas.*

The generic reference to *Sacchia* in vol. xi., p. 68, is erroneous.]

Myrina crenatulifera, *Tate, antea*, p. 131.

MacDonnell Bay.

[**Lithodomus cuneiformis,** *Tate, antea*, p. 131.

St. Vincent-Gulf.]

[**Barbatia Carpenteri,** *Dunker.*

Ref. and Syn.—Anomalocardia Carpenteri, Dunker, Nov. Conch., t. 30, figs. 7-9, 1860. *Arca (Barbatia) radula,* E. A. Smith, Challenger Lamellibranchiata, p. 260, t. 17, figs. 3-3b. 1885.

There can be no doubt that the above-quoted names refer to one species only; indeed, the types of each are from the same locality—Port Philip Bay, in Victoria. The name employed in the Challenger Report is adopted from the M.S. of A. Adams, in the Cumingian Collection, and its earliest appearance in print is due to Angas, in Proc. Zool. Soc., 1865, p. 655—thus five years after Dunker's diagnosis. Dunker's name must in all fairness be accepted.]

Lima squamosa, *Lamarck.*

If the difference in the number of ribs be a reliable distinctive character to separate *L. squomaso* and *L. multicostata* (there being about 24 to the former and about 36 to the latter), then *L. squamosa* must be included in our local list; as Mr. Adcock has collected two medium-sized valves on the beach at Port Lincoln. both species are recorded from the tropical seas of Australia, but I do not know of an authentic occurrence of *L. squamosa* in any other part of Australia. It is true that Menke records the name for Swan River, but it is not certain if it be correctly applicable, as at the time when Menke wrote his "Molluscorum N. Hollondiæ," the Sowerbian species had not been separated from that of Lamarck.

Pecten undulatus, *Sowerby.*

Ref.—Thes. Conch., vol. i., p. 60, t. 19, figs. 206, 207; *id,* Reeve, Conch. Icon., t. 20, fig. 73.

A white, triangularly orbicular, depressed shell, ornamented with seven or eight broad rays, which are radially ribbed; the interstitial spaces with shagreen-sculpture. About an inch-and-a-half in diameter.

Off Corney Point, in 17 to 30 fathoms; and Investigator's Straits, in 15 fathoms *(Dr. Verco).* Also Port Phillip Bay!; off East Moncoeur Island, Bass Straits *(Challenger Report),* and Tasmania.

[**Terebratulina cancellata,** *Koch.*

By a typographical error, this species was quoted in vol. IX. p. 110, as *Terebratella cancellata.*]

The Gryllacridæ and Stenopelmatidæ of Australia and Polynesia.

By J. G. O. Tepper, F.L.S.

[Read September 6, 1892.]

The Gryllacridæ and Stenopelmatidæ form the two last families in Brunner van Wattenroyls' system of the Locustodea. They resemble each other considerably in general appearance, and approximately in habit; but while the former possess depressed tarsi without pulvilli, or sole pads, and lateral expansions to all the joints, the latter have compressed tarsi with usually distinct pulvilli and the first and second joints simple. The two families may be thus diagnosed:—

Gryllacridæ.—Tarsi depressed, first and second joints with lateral lobes separated by a furrow. Fore tibiæ without foramina and above without apical spines. Hind tibiæ above with single apical spines, below with two on each margin.

Stenopelmatidæ.—Tarsi compressed, first and second joints without lateral appendages, mostly provided with pulvilli. Fore tibiæ often with foramina, above with apical spines on each margin. Hind tibiæ above with single, below with two apical spines on both margins.

Although both resemble the Gryllodea, or Crickets, considerably, and have been classed with them by older authors, including Stäl, their relationship with them is quite remote, and the four-jointed tarsi, the structure of the wings and the ovipositor relegate them to the Locustodea, notwithstanding their cricket-like habits and appearance. Brunner says:—"The first Gryllid undoubtedly descended from some Locustid, but the Stenopelmatids did not descend from that Gryllid, but were—if one may so express oneself—a second departure of the Locustids in the direction of the crickets."

In Brunner's monograph are 11 genera of Gryllacridæ and 36 of Stenopelmatidæ described as known, the former consisting of 132 species (*Gryllacris* alone of 95), and the latter of 91, whose general distribution will be apparent at a glance at the following table.

	Gryll.	Stenop.	Gryll. in 2 continents.
Europe	0	4	—
Asia and Malayan Archipelago... ...	65	14	3
Africa, with Madagascar, &c.	19	22	1
North and Central America	5	29	—
South America and W. India	10	7	—
Australia and Tasmania	21	4	1
Polynesia, incl. N. Guinea, N. Caledonia, Fiji, New Zealand, &c.	15	11	4
Habitat unknown...	2	—	—
	137 sp.	91 sp.	9 sp.

In this paper three new genera of Gryllacridæ and two of Stenopelmatidæ are added. Described as new of the former are 18 species and of the latter three, thus raising the totals of the Gryllacridæ to 155 species in 14 genera, and the others to 94 species in 39 genera, and for Australia and Polynesia alone to 39 species of Gryllacrids in 10 genera, and 18 species of Stenopelmatids in 11 genera.

In glancing at the above table it will be noticed that Europe is the only continent from which the Gryllacrids are wholly absent, while in Asia and the adjoining Austral-Polynesian regions they attain their greatest development (119 sp.), the tropical and temperate zones forming their exclusive habitat. The Stenopelmatids show a different distribution. Being found in all continents, of which Europe contains the fewest, they reach their greatest development in the widely-separated African and North American regions, the intermediate Asiatic-Australasian region only furnishing a moderate variety, notwithstanding its immense extent. Strange to say, South America and the West Indian Island furnish the minimum of both families, notwithstanding most favourable climatic conditions, and for which the want of sufficient exploration can scarcely afford an adequate explanation.

The individuals of both families are nowhere numerous or even common. Their habits are extremely retired, and little known in detail. Many species are undoubtedly nocturnal, notably those of almost uniformly dingy or dark colouring; while the tiger-like banding of black and yellow of many Australian species appears to denote diurnal activity among grass. Some species of the Stenopelmatids never see the light of day, exclusively inhabiting dark caves. All cave-inhabiting Orthoptera belong to that family.

Most of those Australian Gryllacridæ which have been observed by me live by day in hollows under logs of wood, stones, vegetable rubbish, in disused outhouses, &c.; many inhabit hollow spaces under bark on the trunks and thicker branches of Eucal-

ypts, their lair having two openings usually. While at rest in these, their head is near and toward one of the openings; the long, highly flexible antennæ being stretched behind towards the other, so as to receive timely warning of the approach of an enemy or prey from that direction. When disturbed they prove very nimble and swift runners, but do not as a rule take to-wing in daylight or in wet weather, but do so at night, or even in cloudy afternoons before sunset. If handled incautiously they are able to inflict severe bites, drawing blood readily, their mandibles being very strong, sometimes of enormous size, and the largest in general among insects. Being carnivorous, they are highly beneficial in assisting to keep down other species that would be highly injurious to agriculture if increasing without check.

I. GRYLLACRIDÆ.

The Gryllacridæ are distinguished from all other Locustids (1) by the delicate, mantis-like structure of their wings, which are richly provided with veins and veinlets, but without tympanal organs; (2) the long, articulately-inserted, movable spines on the under side of the fore and middle tibiæ; and (3) the lobe-like lateral expansion of the tarsal joints. The last abdominal segment of the male is also very abnormal, the eighth being usually enlarged, still more so the ninth, becoming cucullate and enclosing the anal organs. Brunner has figured eight different types, without, I think, exhausting them. These, however, are scarcely generally useful for more than specific distinction when both sexes are known, and assist in no wise the mating of individuals, because no corresponding structure or proportionate character exists in females.

Presence or absence of wings forms a good character to separate the family into three groups, as the organs of flight are either perfect, more or less rudimentary or wholly absent. When rudimentary, it is easy, as pointed out by Brunner long ago, to distinguish adults from nymphs by observing whether the anterior or costal margin is directed upwards or downwards, the latter infallibly denoting the adult, the former the nymph-stage. The size, shape, and venation of the wing-lobes form good specific or even generic characters.

The anterior (perfect) organs of flight, known as elytra or tegmina, are so richly and variably supplied with veins and veinlets, that their venation is useless for the object of diagnosis, while the form of the apex can only be employed in closely-related species.

The posterior or real wings, however, afford good characters for distinction by the various colouring of veins and membrane.

These are either uni-colorous or of different tints, the veins and veinlets being either lighter or darker than the membrane, or *vice versa*, or the former lined on either side more or less by lighter or darker borders.

The chest or pectus is of very uniform structure, and only in the genus *Epacra* are there any prominent lobe-like expansions

The ovipositor is more or less straight in the adult, of considerable length usually, and stout at the base, where the lower valves are sharply turned up and quite enclosed by the upper ones. The apex is smooth and shining, neither acute nor serrated. In the nymph-stage it is shorter than in the adult, and often (if not always ?) shortly incurved from near the base and carried over the back. Its length, curvature, &c., afford good characters.

Size and proportions of the various species appear to be fairly constant, also the colouring, which cannot be neglected in determination.

The most prominent characters are, however, found in the number, size, and arrangement of the spines of the legs, especially of the under side of the hind femora and the upper side of the hind tibiæ, also the relation they exhibit in number and size to each other. The femoral spines are in four to five pairs in the majority of the Australian species examined by me, but are wanting wholly or partially in rare cases, or increase to nine. Those of the hind tibiæ are quite as variable. Even this character, however, cannot be wholly relied upon, as the numbers not only vary within the species, but actual disparity in the same individual may occur, obsolete spines being indicated by wider intervals or minute tubercles, and increase of numbers by intercalated spinelets separated by narrower interspaces. But the greatest uniformity prevails in regard to the movable spines of the fore and middle tibiæ, at least in those examined by me. Here the number is five on each margin, the only exception observed being a female of *Eonius tigrinus* with four pairs. The same remark applies to the spines of the under side of the hind tibiæ, the usual number being three. The subjoined table of the variations of the spines of hind femora and hind tibiæ will show the extent of the observed variability, rarely obscured by other characters, and also serve as a ready means of identification.

TABLE showing Variability of Spines of Hind Legs in the Species and Sexes of AUSTRALIAN GRYLLACRIDS and STENOPELMATIDS.

		Hind femora below.				Hind tibiæ above.			
	Sex.	Right Side. intus	Right Side. extus	Left Side. intus	Left Side. extus	Right Side. intus	Right Side. extus	Left Side. intus	Left Side. extus
A. GRYLLACRIDÆ.									
Gryllacris magnifica ...	Fem.	9	4	8	4	5	4	5	4
atrogeniculata	Male	4	3	4	3	5	6	5	6
	Fem.	5	4	5	4	3	4	3	4
marmoriceps	M.	3	4	4	3	3	3	3	3
	F.	4	3	3	3	3	3	3	3
var. nigrifrons	F.	1	3	4	5	3	3	3	3
longicornis	M.	5	3	5	3	0	0	0	0
	F.	5	4	5	2				
	(nymph)	5	3	5	4	0	0	0	0
	"	5	2	4	3				
ferrotestacea	F.	4	3	4	4	5	4	5	4
	F.	3	4	4	4	3	4	5	4
lutescens ...	M.	5	4	5	4	6	4	4	4
	F.	4	4	4	4	4	4	5	4
	"	4	4	4	4	5	4	4	3
	"	4	3	4	3	4	4	6	4
	"	4	4	4	3	4	4	4	4
straminea ...	—	2	6	4	7	6	6	6	6
subdebilis ...	—	4	7	4	2	5	7	6	5
incerta	F.	9	4	11	5	6	6	6	6
paulula	—	4	5	3	5	4	4	4	4
Molineusiana ...	—	8	8	9	8	7	6	7	6
Paragryllacris infuscata	M.	5	4	5	4	5	4	5	4
	F.	5	4	5	4	7	5	7	5
latelineolata	F.	5	4	5	3	3	4	2	4
	"	6	4	5	3	4	4	5	5
pallidolinea	M.	5	3	5	3	4	4	3	3
	F.	4	4	4	4	4	2	4	4
	"	5	3	5	4	4	4	4	4
var. minor	M.	5	3	4	3	5	4	6	4
	F.	4	3	0	0	4	3	3	3
	"	4	3	3	3	4	3	—	—
insignis ...	M.	4	4	6	4	4	4	5	4
deserta ...	M.	2	3	3	3	3	5	5	5
Eonius tigrinus	F.	3	2	2	3	4	4	4	4
	"	2	2	2	2	4	4	4	4
atrofrons	F.	6	5	5	4	6	3	6	3
fumatus	F.	2	3	3	3	6	4	5	4
Apteronomus Bordaënsis	M.	5	2	5	4	6	5	5	5
	"	5	3	5	2	5	4	5	5
var. ? ...	"	0	0	0	0	5	4	5	4
Ametrosomus Helmsi...	F.	6	5	7	8	9	7	10	6
	"	3	3	4	5	9	5	10	5
B. STENOPELMATIDÆ.									
Penthoplophora Driffieldi	F.	10	2	9	1	10	8	10	7
Pachypodagrus crassipes	M.	12	6	13	5	6	6	6	6
	"	12	5	12	4	6	5	6	5
	F.	12	6	12	7	9	8	6	6
Magareyi ...	F.	6	0	6	0	6	6	6	6

The following list of genera indicates their general distribution, and the systematic place of the new ones :—

Gryllacris, *Serv.*, all regions.
Dibelona, *Br.*, South America.
Hyperbænus, *Br.*, South America.
Paragryllacris, *Br.*, Australia.
Neanius, *Br.*, Australia.
Eonius, *gen. nov.*, Australia.
Eremus, *Br.*, Old World.
Epacra, *Br.*, Australia.
Apotrechus, *Br.*, Australia.
Apteronomus, *gen. nov.*, Australia.
Ametrus, *Br.*, Australia.
Ametrosomus, *gen. nov.*, Australia.
Schizodactylus, *Brullé*, Asia.
Comicus, *Br.*, Africa.

The principal work upon which this paper is based is Brunner's Monograph of the two families, Vienna, 1888, and his descriptions of the species not actually known to me are herein reproduced. The abbreviation "Br." signifies that author's name.

Gryllacris, *Serville*

Head short, globose. Occiput covered by pronotum. Vertex declined, fastigium usually wider than first antennal joint, margins obtuse, acute or keeled, and contiguous in a straight line with the frontal. Antennæ very long, usually about three times the body; joints numerous, first joint large, more or less gibbous. Eyes pear-shaped, rather prominent. Usually three ocelliform spots. Face broad, transverse or elongate. Cheeks rounded, and quite smooth. Mandibles strong. Pronotum short, truncate before and behind, disk uneven, more or less coloured; deflexed lobes roundly inserted and low, inferior margin straight. Elytra and wings *perfectly explicate*, former ample, more or less hyaline, many-veined, transverse veinlets very distinct, more or less brownish, alike in both sexes. Hind wings cycloidal, hyaline and diversely coloured, veins and veinlets often bordered brownish. Pectus narrow, *meso- and meta-notum obscurely triangular.* Fore coxæ armed with a spine. Fore and middle femora compressed, sulcate below, unarmed. Hind femora compressed, dilated cricket-like, sulcate below, the margins more or less spined. Fore and middle tibiæ terete above, with 4-5 articulately inserted spines on each margin below. Hind tibiæ *flattened above, with (mostly) five spines on either side*, also *three short apical spurs.* Three first tarsal joints *broadly lobed laterally, lobes of fourth joint much longer*, claws small. Abdomen obese, seventh and eighth segments of male more or less inflated, arched, latter often much

elongated, ninth segment narrow at apex, furcately deflexed, wholly enclosing the anus. Cerci elongate, pilose. Subgenital lamina of male *transverse with articulately inserted styles.* Ovipositor incurved, elongate, rarely straight, apex obtuse or obliquely truncate, superior valves enclosing the inferior at the base.

GRYLLACRIS CYANEA, *Br.* (Mon., 82).

"Head *brownish-blue, labrum black,* face with three citron-yellow ocelliform spots. Antennæ, first two joints brownish, remainder pale. Pronotum laterally with reddish ferruginous callosities, deflexed lobes bordered black. Elytra *testaceous,* transverse veinlets *broadly bordered with brown.* Wings smoky, veinlets bordered brown. Fore and middle legs *blackish blue.* Hind femora with upper longitudinal half ferruginous, lower blackish-blue, below with five internal and eight external spines. Hind tibiæ chestnut-brown. Ovipositor very straight and slender, brown, apex obtuse. Subgenital lamina triangularly emarginate.

	Female.
Length of body	27 mm.
Length of pronotum	5 "
Length of elytra...	21 "
Length of hind femora	16 "
Length of ovipositor	23 "

Habitat.—North Australia."

GRYLLACRIS MAGNIFICA, *Br.* (ibid, 83).

Size large. Head, pronotum, and legs brownish-black, or in reflected light dark-blue. Antennæ lighter or duller brown, or the basal half blackish. Face with impressed dots. Ocelliform spot rather small, triangular, oval, or orbicular, pale to bright yellow. Labrum and mandibles ferruginous to reddish. Pronotum with deep transverse furrows near fore and hind margins, a conspicuous rounded ridge preceding the latter; medial line narrow, impressed; lateral lobes somewhat higher behind, subangular, inferior margin rounded. Elytra testaceous, hyaline (white and opaque with spirit specimens); veins testaceous to brownish; transverse veinlets from deep brownish black to light brown. Wings pale smoky, or concolorous with elytra, veinlets narrowly bordered with brown, and forming very regular concentric lines. Hind femora below with eight to nine internal and four external pale spines with black tips. Hind tibiæ above with five internal and four external spinelets. Abdomen above with all the segments banded brownish or black at the base. Ovipositor nearly straight, very long, apex conical. Subgenital lamina of female triangular, apex rounded.

	Female.
Length of body	24--29 mm.
Length of pronotum	5 "
Length of elytra	45--52 "
Length of hind femora	13--16·5 "
Length of ovipositor	35--43 "

Habitat.—Port Adelaide, Lyndoch, &c., South Australia; Broken Hill, Central Australia (Coll. S.A. Mus.).

Brunner's description of this magnificent species is unmistakably applicable to the four specimens in the Adelaide Museum, but as they vary in size and colour, it has been slightly departed from. The insects live solitarily under logs, &c., when the ground is dry, or under the loosely-adhering dry bark of Eucalypts, usually about the thicker branches. They appear to be much rarer now than they were some thirty years ago.

Gryllacris atrogeniculata, *spec. nov.*

Size moderate. Head from front view broadly *oval*, testaceous, occiput and fastigium deep lustrous brownish black. Fastigium *rather more than twice the width of first antennal joint.* Ocelliform spot scarcely distinct. Face, clypeus, labrum, base and first two joints of antennæ, and the palpi testaceous, borders of frontal fastigium, and a spot under each eye, deep brown. Pronotum with disk rotundately depressed or rounded, fore and hind-margin raised, convex; interruptedly impressed medial line broadly bordered with deep brown, the colour extending to scutellum. Elytra of male *exceeding abdomen by about half their length*, of the *female scarcely reaching base of ovipositor*, testaceous, veins and veinlets brown, apex subacute. Legs of body-colour, except *apex of femora* and *base of tibiæ*, which are *deep black.* Hind femora incrassated at the base only (female) or to the middle (male), below with four to five internal and three to four external spines. Hind tibiæ above with three to five internal and four to six external spines. Abdomen of male with eighth segment produced, ninth segment cucullate, sulcate, pilose. Subgenital lamina of male with the medial lobe *much extended, quadrate, apical angles produced laterally*, lateral lobes not extended, angular. Styles slender, pilose. Ovipositor stout, straight, apex incurved, obliquely acuminate from below, acute, finely serrated above.

	Male.	Female.
Length of body	25 mm.	32 mm.
Length of pronotum ...	4 5 "	6 "
Length of elytra	38 "	28 "
Length of hind femora ...	12 "	15 "
Length of ovipositor ...	—	12·5 "

Habitat.—Leigh's-Creek *(Poole)*, The Peake, Central Australia *(Driffield)*, (Coll. S.A. Mus.).

The species resembles Brunner's *G. nigrogeniculata* (male, Manilla) in general aspect, but the elytra are twice as long, the fastigium much wider, the spines of the hind femora much less in number, &c., hence I have considered the creation of a new species justifiable.

GRYLLACRIS MARMORICEPS, *spec. nov.*

Size moderate to large. Head oblong from front view, vertex much raised above pronotum. Face pale, with fine impressed dots; apex of labrum (male) or clypeus (female) brown, marginal ridges of cheeks dark brown, also the mandibles. Fastigium of vertex twice as wide (male) or wider (female) than first antennal joint, much depressed and flattened, marbled *paler and darker testaceous and traversed by black sinuous lines.* Lower ocelliform spot conspicuous, small, oval, acuminate above, pale-yellow; upper pair subtrigonal, dull, all bordered blackish, this colour extending to apex of fastigium, and continues in three sinuous black lines to posterior margin of occiput, two being lateral and one central, the former joined obliquely at two-thirds of their course (from front) to the middle one by emitting on either side a fine but often interrupted line, the central line being continued *from* the junction to the hindmargin; a depressed, pale, pyriform spot at the base of either of the antennæ borders and defines the frontal fastigium. Disk of pronotum straight, flattened, with a short black medial streak in front and a depressed line behind; fore margin convex, hindmargin nearly straight; deflexed lobes longer than high, nearly quadrangular, angles rounded, callosities promiscuous. Elytra more than one and a half times the length of body, veins slightly darker than body-colour. Wings rather longer than elytra, very pellucid, veins and veinlets not bordered darkly. Hind femora (male) with three or four external, and two internal spinelets (female with three). Hind tibiæ above with three or four very minute spinelets on either margin. Abdomen with ninth segment cucullate, *external margin densely but minutely spined, centrally with two very much longer spines*, remote from each other and the lateral ones. Ovipositor nearly straight, gradually tapering, apex dark, rugose, acuminate.

	Male.	Female.
Length of body... ...	34·5 mm.	37 mm.
Length of pronotum ...	6·5 "	7·5 "
Length of elytra ...	50 "	50 "
Length of hind femora...	17 "	18·5 "
Length of ovipositer ...	— "	39 "

Habitat.—Morgan, on the Lower Murray River, South Australia *(Evans)* (Coll. SA. Museum).

VAR. NIGRIFONS.

Size smaller than the typical form, which it resembles in aspect and in the markings of the head, but differing by a broad deep black band across the face, almost obliterating all other markings, except the small, nearly circular ocelliform spot. The size is very variable, also the number of spinelets of the hind femora, which vary from 3-5 external and 1-4 internal ones, the hind tibiæ exhibit three on each upper margin with all the specimens before me. The antennæ are about four times the length of the body.

	M.	M. (nymph)	F.	F.	F. (nymph)
Length of body ...	23 mm.	20 mm.	30 mm.	21 mm.	30 mm.
Length of pronotum...	4 "	4 "	5 "	5·5 "	6 "
Length of elytra ...	39 "	9·5 "	34 "	35 "	13 "
Length of hind femora	15 "	12 "	15 "	16·5 "	15 "
Length of ovipositor...	—	—	29 "	35 "	18 "

Habitat.—Ardrossan, Yorke's Pen. (M. & F., *Cadd)*; vicinity of Adelaide (M. nymph, F. and F. nymph), South Australia (various contributions) (Coll. S.A. Museum).

The species with its variety is one of the best characterised among those examined on account of the constant markings of the head. Should the variety be deemed to deserve raising into higher rank, its varietal name might become the specific.

GRYLLACRIS LONGICORNIS, *spec. nov.*

Size large. Rusty testaceous, concolorous. Head from front view oblong-oval. Face rugose, with impressed dots, shining. Labrum (adults) oval-elongate. Clypeus subhexagonal, lateral sides shortest; above the latter *a short, conspicuous ridge* on each side, parallel, *directed towards the space between the eyes and antennæ.* Antennæ very long and slender, exceeding four times the length of body; first joint slender. Fastigium of vertex rounded, shiningly smooth, about four times the width of first antennal joint, apex slightly emarginate, apical and lateral margins *bordered narrowly with a pale line revurving upon itself, pale medial line continued to hind margin.* Space between these marginal lines, occiput and sides of head *minutely and irregularly marbled by fine pale lines*, area between them darker than the body-colour. Eyes elongate, black. Pronotum unmarked, anterior and posterior margins straight; lobes much longer than high, inferior margin straight, parallel; humeral sinus very small. Elytra and wings concolorous, pellucid; veins and veinlets of body-colour. Wings with transverse veinlets, bordered very narrowly with dark testaceous. Fore and middle legs long and slender; hind legs much incrassated at base; hind femora below

with two to four external and four to five internal spinelets, being variable on the left and right of the same individual. Hind tibiæ above *scarcely flattened and unarmed*, or the spinelets almost imperceptible with a lens. Ovipositor very slender, nearly straight, gradually pointed, shorter in the nymph than the adult, and, being shortly recurved, is carried over the body. One adult female and two female nymphs.

	Female—Adult.	Nymphs.
Length of body ...	... 35 mm.	28 mm.
Length of pronotum	... 8 "	7 "
Length of elytra ...	... 46 "	9·5–10 "
Length of hind femora	... 16 "	15 "
Length of ovipositor	... 27 "	12–15 "

Habitat.—Palmerston, Northern Territory of South Australia (presented by the Hon. S. J. Magarey, M.B.) (Coll. S.A. Museum).

GRYLLACRIS FERROTESTACEA, *spec. nov.*

Size rather large. Ferruginous testaceous, concolorous. Head from front view oval. Face rugose; labrum *subcircular*, *raised basal part small*. Clypeus transverse, *anterior and posterior margins straight*. Mandibles and eyes black. Ocelliform spot of body-colour, elongate, acute above. Fastigium of vertex highly arched, twice as wide as first antennal joint, apex more or less emarginate, unmarked. Antennæ about two and a half times as long as the body, and of the colour of the latter entirely. Pronotum with the disk somewhat saddle-shaped, flattened, and with a depressed medial line; fore and hind margins convex, former sometimes with a short black line, latter with a black band; lobes *slightly longer than high*, margins straight, angles rounded. Elytra and wings long, concolorous; veins ferruginous, veinlets paler, membrane pellucid. Hind femora stout, below with four spinelets on each margin usually. Hind tibiæ above with four external and five internal spinelets. Ovipositor very slender, considerably incurved, *finely hirsute*; apex gradually acuminate, not acute; inferior keels *short*, *enclosing a small circular depressed area*.

	Female.
Length of body	27–34 mm.
Length of pronotum	5 "
Length of elytra	50 "
Length of hind femora	15–17 "
Length of ovipositor	44–45 "

Habitat.—Northern Territory of South Australia (presented by Dr. S. J. Magarey) (Coll. S.A. Museum).

This species resembles *G. lutescens* in general aspect, but the colour and various other distinctions render it advisable to separate the two for the present, until the discovery of the other sex will decide the question.

GRYLLACRIS LUTESCENS, *spec. nov.*

Size large. Pale dirty yellow. Eyes, *fore and hindmargins of pronotum*, bases of abdominal segments, banded black or blackish. Head oval, wider than the pronotum, face slightly rugose with irregular impressed dots, ridges not conspicuous. Labrum almost *circular*, the *middle of base suborbicularly raised* with a medial depressed line continued over the clypeus, which is transverse, posterior margin curved. Frontal fastigium short, inferior limit undefined. Ocelliform spot oblong, acute above, *ivory white*. Space between the antennæ mostly *blackish*, and *enclosing the three pale spots*. Fastigium of vertex short, about one and a-half times the width of first antennal joint, with conspicuous lateral keels, unmarked. Antennæ very slender, pale, about four times the length of body. Eyes black. Pronotum with *fore margin straight, more or less marked with black*, hindmargin *rounded*, produced, *bordered broadly with black;* lobes slightly higher in front, margins straight, angles rounded. Elytra and wings testaceous, pellucid. Transverse veinlets of the latter pale, very slightly bordered dusky. Hind femora below with four spinelets on each margin usually. Hind tibiæ above with five to six external and four internal spinelets. Abdomen of male with ninth segment cucullate (Brunner's type "D"), internal margin *not dentate*, but *centrally with two long spines*. Subgenital lamina of male *deeply trilobate, each lobe again emarginate*. Ovipositor sword-shaped, slender, apex conical. Subgenital lamina of female oboval, keels widely separating, extending to the apex. One male, four females.

	Male.	Female.
Length of body ...	30 mm.	28–37 mm.
Length of pronotum ...	5 "	5–5·5 "
Length of elytra ...	47 "	36–40 "
Length of hind femora	15 "	15–17 "
Length of ovopositor ...	— "	33–40 "

Habitat.—Innamincka, Central Australia, &c. (Coll. S.A. Museum).

GRYLLACRIS DIMIDIATA, *Br.* (Mon. 87).

"Size large. Colour brownish testaceous. Face black. Femora all black below. Knees testaceous, also all the tibiæ.

	Female.
Length of body	30 mm.
Length of pronotum	8 "
Length of elytra	39 "
Length of hind femora	20 "
Length of ovipositor	25 "

Habitat.—New Britain."

Gryllacris excelsa, *Brunner* (Mon. 107, fig. 41, D.).

"Size large. Colour testaceous. Head brownish. Labrum testaceous. Antennæ brown. Femora below and at apex brownish.

	Male.	Female.
Length of body	48 mm.	42 mm.
Length of pronotum ...	11 "	11 "
Length of elytra	38 "	35 "
Length of hind femora ...	26 "	23 "
Length of ovipositor ...	—	26 "

Habitat.—Duke of York Island."

Gryllacris appendiculata, *Br.* (ibid 108, fig. 41, H.).

"Size small. Brownish ferruginous, with piceous marks. Occiput and pronotum with brownish lines, latter also with two lateral brown lines, but without the medial line. Wings hyaline, transverse veinlets bordered brownish.

	Male.	Female.
Length of body	28 mm.	32 mm.
Length of pronotum ...	7 "	7·8 "
Length of elytra	27 "	31 "
Length of hind femora ...	18 "	19 "
Length of ovipositor ...	—	20 "

Habitat.—New Britain."

Gryllacris aurantiaca, *Br.* (ibid 112).

"Size small. Ferruginous. Fastigium of vertex depressed, margins keeled. Wings deeply orange at the base, fore part without brown marks, the brownish bands distinctly circumscribed. Abdomen of male with ninth segment rounded. Ovipositor falcate. Subgenital lamina of female flat.

	Male.	Female.
Length of body ...	28 mm.	27–31 mm.
Length of pronotum ...	6·5 "	7– 7·8 "
Length of elytra ...	27 "	27–29 "
Length of hind femora	16 "	16–18 "
Length of ovipositor ...	—	1–17 "

Habitat.—New Britain, Amboyna."

Gryllacris dubia, *Le Guillon* (ibid 111).

"Deeply ferruginous. Wing concolorous, pale, hyaline, veins and veinlets pale. Hind femora below with ten very minute spinelets on each margin. Fore tibiæ above brownish, streaked with blackish, also hind femora.

	Female.
Length of body	22 mm.
Length of pronotum	5·6 "
Length of elytra	20 "
Length of hind femora	14·8 "
Length of ovipositor	16 "

Habitat.—Fiji Islands."

Gryllacris oceanica, *Le Guillon* (Br. Mon., 112).

" Pale reddish-yellow, medial ocelliform spot small, labrum brownish-yellow, mandibles brownish-red, palpi testaceous, elytra subpellucid, all the tibiæ brownish in the middle. Abdomen brownish above." Length of body of male, 19 mm. (Original description, 1841).

Habitat.—Hamoa (most probably Samoa) Island."

Gryllacris straminea, *Br.* (ibid, 115).

Size moderate. Straw-coloured. Head oblong from front view, depressed. Face brownish-ferruginous, mandibles much darker; medial line raised, uncoloured; ocelliform spot large, angularly oval, yellowish-white, extending almost to the apex of frontal fastigium. Eyes black, elongate-oval. Fastigium of vertex scarcely as wide as the first antennal joint; apex prominent, ferruginous, slightly sulcate. Antennæ wholly pale, concolorous with body; about five times the length of the latter; first joint longer than the eyes. Pronotum with the disk very uneven, medially depressed, foremargin rotundately produced, hindmargin almost straight, shortly emarginate; lobes with the inferior margin semicircular, deeply sulcate. Elytra and wings very pale and pellucid, veins and veinlets concolorous with membrane, in length slightly exceeding the ovipositor, apex of former acuminate. Legs rather short. First spine of fore and middle tibiæ longest, the others gradually shorter. Hind femora below, with two to four internal and six to seven external spinelets, mostly very small. Hind tibiæ above, with six spinelets on each margin. Ovipositor curved downward at the base, then almost straight; apex incurved, gradually acuminate, shining. One female.

	Male *(Brunner)*.	Female.
Length of body	24 mm.	22 mm.
Length of pronotum ...	4·5 "	4 "
Length of elytra	36 "	36 "
Length of hind femora ...	14 "	14 "
Length of ovipositor ...	—	19 "

Habitat.—South Australia (Adelaide, *Brunner)* (Coll. S.A. Museum).

In so assigning the female in the South Australian Museum, from which the above description has been mainly drawn up, it must be remarked that, though slightly shorter in the body, it agrees very well with the principal characters, the differences being sexual and individual.

GRYLLACRIS LIGATA, *Br.* (Mon., 115).

"Size large. Pale testaceous. Head pale, face with a broad, deeply black transverse band; also the pronotum. Ovipositor narrow, acuminate, incurved.

	Male.	Female.
Length of body	45 mm.	47 mm.
Length of pronotum ...	8 "	10 "
Length of elytra	43 "	48 "
Length of hind femora ...	18 "	22 "
Length of ovipositor ...	—	33 "

Habitat.—New Britain, and New Hanover Islands."

GRYLLACRIS DEBILIS, *Br.* (ibid, 116).

"Size small. Pale ferruginous. Fastigium of vertex rounded, one and a half times the width of first antennal joint. Ocelliform spot scarcely distinct. Elytra obtuse, subpellucid. Wings cycloidal, hyaline. Femora at apex and base of tibiæ reddish. Hind femora below, with four internal and five external spines. Ovipositor slender, scarcely incurved, and scarcely exceeding the hind femora, acuminate. Subgenital lamina of female obtusely triangular.

	Female.
Length of body	21 mm.
Length of pronotum	4 "
Length of elytra	18 "
Length of hind femora	10·5 "
Length of ovipositor	12·5 "

Habitat.—North Australia."

GRYLLACRIS SUBDEBILIS, *spec. nov.*

Size small. Uniformly testaceous. Head from front view suborbicular, depressed. Face with indistinct *pale medial line, ocelliform spots none. Eyes and mandibles black.* Fastigium of vertex twice as wide as first antennal joint; lateral ridges near apex narrowly brownish; also a small spot on each side of superior external angle of clypeus. Antennæ about twice the length of body, and of the same color. Pronotum with disk subtriangular, medially depressed; fore and hindmargins raised, former convex, latter concave; lobes deeply sulcate, inferior margin slightly rounded, angles subrotundate. Elytra scarcely

exceeding the ovipositor, concolorous. Wings shorter, similar to elytra. Legs long, pale. Hind femora below with four external and seven internal spinelets (on the right, while there are only two on the left). Hind tibiæ above with five to seven external and five to six internal spinelets. Ovipositor *short, much incurved, acuminate*, and with a *fuscous line on each side.*

	Female.
Length of body...	16 mm.
Length of pronotum	4 "
Length of elytra	21 "
Length of hind femora...	12·5 "
Length of ovipositor	7·5 "

Habitat.—Northern Territory of South Australia (Coll. S.A. Museum). (Presented by Hon. S. J. Magarey, M.B.).

This species appears to be allied to *G. debilis, Br.*, but differs from it and all others examined in the structure of the pronotum, elytra, and ovipositor, the latter especially being remarkably short.

GRYLLACRIS FERRUGINEA, *Brunner* (Mon., 117).

"Size small. Deeply ferruginous. Resembling *G. debilis.* Pronotum deeply sulcate. Elytra deeply ferruginous. Hind femora below with 10 spinelets on each margin.

	Male.	Female.
Length of body	10 mm.	21 mm.
Length of pronotum ...	5·6 "	5·6 "
Length of elytra ...	19 "	19 "
Length of hind femora...	13 "	13 "
Length of ovipositor ...	—	14 "

Habitat.—Fiji Islands."

GRYLLACRIS EXIGUA, *Br.* (ibid, 117).

"Size very small. Testaceous. Fastigium of vertex scarcely wider than first antennal joint, obtuse. Antennae very long. Elytra ferruginous, less than one and a half times the length of the hind femora. Latter below almost smooth. Described from a specimen without body.

Length of pronotum	3·5 mm.
Length of elytra	10 "
Length of hind femora	8·5 "

Habitat.—New Caledonia."

GRYLLACRIS HYALINA, *Br.* (ibid, 117).

"Size moderate. Straw-coloured. Fastigium much wider than first antennal joint. Ocelliform spot citron-coloured, elliptical. Elytra acuminate, straw-coloured, subpellucid, two and a

half times longer than hind femora. Wings obtuse, triangular, subhyaline. Hind femora with eight internal and five external spinelets. Ovipositor almost straight, acuminate. Subgenital lamina of female triangular, with incurved sides, apex truncate.

	Female.
Length of body	18 mm.
Length of pronotum	4 "
Length of elytra	25 "
Length of hind femora	10 "
Length of ovipositor	14 "

Habitat.—Australia."

GRYLLACRIS GEMINA, *Br.* (Mon., 17).

"Resembles the preceding, but differs by the fastigium being scarcely wider than the first antennal joint; elytra nearly three times the length of the hind femora, latter dotted with black, all the tibiæ at the base indistinctly blood-red, and the subgenital lamina of the female very little emarginate.

	Female.
Length of body...	18 mm.
Length of pronotum	4 "
Length of elytra	32 "
Length of hind femora...	11·5 "
Length of ovipositor	14 "

Habitat.—North Australia."

GRYLLACRIS MAJOR, *Br.* (ibid, 118).

"Size moderate. Straw-coloured. Fastigium scarcely wider than first antennal joint, flattened. Ocelliform spot large, citron-coloured. Elytra very large, acuminate, about three times larger than hind femora. Latter with seven to eight long spinelets on each margin. Tibiæ blood-red about the base. Ovipositor distinctly incurved. Subgenital lamina of female obtusely triangular.

	Female.
Length of body	21 mm.
Length of pronotum	5 "
Length of elytra...	41 "
Length of hind femora	13 "
Length of ovipositor	21 "

Habitat.—Sydney, N. S. Wales."

GRYALLACRIS ADVENTA, *Br.* (ibid, 118).

"Resembles the last. Fastigium with subcarinate margins narrower than first antennal joint. Hind femora below with

four to five spinelets on each margin. Ovipositor nearly straight, apex suddenly incurved, acuminate. Subgenital lamina of female narrow in the middle, apex truncate, quadrangularly emarginate.

	Female.
Length of body	23 mm.
Length of pronotum	4·5 "
Length of elytra	34 "
Length of hind femora	12 "
Length of ovipositor	17 "

Habitat.—Queensland."

GRYLLACRIS INCERTA, *spec. nov.*

Size rather large. Pale testaceous. Head from front view subglobose, much wider than pronotum. Face pale, nearly smooth, shining. *Clypeus shortly subtriangular, emarginate.* Labrum *short, broader than long, base narrow, with a ridge fitting into the emargination* of the clypeus. Mandibles deep black. Ocelliform spot inconspicuous, orbicular. Fastigium of vertex tumid, termination indistinct, about three times as wide as first antennal joint; subtriangular space between apex and spot whitish, with reddish borders. Pronotum very round, foremargin straight, hindmargin *slightly emarginate;* lobes *higher than long,* margins nearly straight, angles rounded. Elytra broad, twice as long nearly as the body; veins and veinlets of body colour. Wings as long as elytra, pellucid, veinlets pale. Hind femora below with four to five external and ten to eleven internal spinelets. Hind tibiæ above, with six spinelets on each margin. Ovipositor slightly acuminate, somewhat dilated towards the apex, but not acute, and unarmed. Subgenital lamina of female broad, deeply and widely emarginate.

	Female.
Length of body	32·5 mm.
Length of pronotum	5 "
Length of elytra	54 "
Length of hind femora	17 "
Length of ovipositor	32 "

Habitat.—Leigh-Creek, South Australia *(A. A. Poole,* in Coll. S.A. Museum).

There being only a specimen of the female in the collection, the claim to specific rank is perhaps uncertain; but the form of the clypeus, labrum, pronotal lobes, and subgenital lamina distinguish it from all the others. The ova removed from it are oblong-cylindrical, pale testaceous, measure 4·5–5 mm. in length and 1·25 mm. in transverse diameter, and under a Coddington lens, exhibit close, regular, and oblique lines in transverse sets.

GRYLLACRIS PAULULA, *spec. nov.*

Size small. Testaceous. Head oval from front view. Face with upper part blackish-brown variegated, *the lower border extending from below the eye in a semicircular curve to or partly over the clypeus*, with undefined, though distinct, outline; remainder of latter and the labrum pale; mandibles ferruginous, palpi pale. Ocelliform spot oval, acute above, pale yellow. Eyes elliptical, wider above. Fastigium of vertex one and a half times the width of first antennal joint, apex conical, disk in front *rather deeply depressed, bordered by high narrow keels;* exteriorly with a whitish oval spot on each side behind the antennæ, dark-brown (also occiput), and with a fine pale, indistinct medial line. Pronotum saddle-shaped, front straight, with a narrow triangular black spot in the middle; hindmargin straight, slightly raised, with a blackish-brown band extending beyond the humeral sinus; lobes rather high, subangular, margins almost straight. Elytra with apex rounded, veins ferruginous. Wings paler, veins and veinlets scarcely darker than membrane, pellucid. Legs rather long, fore and middle tibiæ, also all knees, pale blackish-brown. Hind femora stout, below with three to four internal and five external spinelets, the emargination between the last spine and the knee being short and deep. Hind tibiæ pale, with four spinelets on each margin. Abdomen, with base of all segments, *banded blackish-brown, dorsally and laterally.* Ovipositor slightly incurved, apex acuminate, subacute, smooth. Subgenital lamina of female semicircular, with two strong keels below. Two females.

	Female.
Length of body	23–25 mm.
Length of pronotum	3–4 "
Length of elytra	25–27·5 "
Length of hind femora	11–13 "
Length of ovipositor	30–34 "

Habitat.—S. Australia; Western Plains *(A. J. Percy)*, Monarto *(Tepper)* (Coll. S.A. Museum).

Allied in size to *G. subdebilis*, and in wing structure to *G. atrogeniculata*, but differing from either by the marking of the face, form of fastigium, the banding of the abdomen, &c.

GRYLLACRIS MOLINEUSIANA, *spec. nov.*

Size small. Pale testaceous. Head from front view subcuneiform, almost flat above. Face blackish-brown, apex of fastigia, disk of clypeus and labrum dark-reddish, margins darker, medial line obsolete, ocelliform spot large, broadly oval, bright yellow, lateral spots on external sides of fastigium also bright yellow. Eyes greyish-brown. Fastigium of vertex about

one half wider than first antennal joint, same as body-colour. Antennæ not much exceeding the elytra in length. Pronotum with disk almost evenly rounded, slightly constricted behind, medial impressed line ending at posterior furrow, foremargin slightly rounded, hindmargin produced, rounded. Elytra and wings ample, veins mostly pale reddish-brown, membrane of body-colour, pellucid, apex bluntly acuminate. Fore and middle tibiæ, also all the tarsi, crimson. Hind femora below with eight external and eight to nine internal spinelets. Hind tibiæ above with seven internal and six external spinelets. Abdomen above the last segment *pitchy and deep black*, eighth segment enlarged, ninth segment with *apex wasp-like acuminate.* Subgenital lamina of male *very short, medial lobe spine-like, lateral lobes almost obsolete.* Styles longer than cerci, both pilose.

	Male.
Length of body	18 mm.
Length of pronotum	3·5 "
Length of elytra	33 "
Length of hind femora...	12 "

Habitat.—Wirrabara Forest Reserve, South Australia (Coll S.A. Museum).

The specimen described was captured and presented by A. Molineux, Esq., F.L.S., the active Secretary of the Bureau of Agriculture, and is dedicated to him as a slight acknowledgment of his unobtrusive and disinterested zeal in promoting natural history for many years. The species is distinct from all others by the intense dark colour of the terminal abdominal segments, the ninth approaching Brunner's type "A," but the subgenital lamina presents quite a different aspect. The external darkly tipped spines of the hind femora are much larger than the internal, the more or less red-coloured ones of the hind tibiæ are almost equal in size.

PARAGRYLLACRIS, *Gerstaecker* (Brunner, Mon., 369, fig. 44).

Habits of *Gryllacris*, but differing in the form of the subgenital lamina of the male, the latter possessing no *articulately* inserted styles, and the hind femora (in the typical form) being armed with five to seven minute spinelets.

Fastigium of vertex usually twice as wide as the first antennal joint. Elytra ample, obtusely acuminate, never obtuse, veins and veinlets more or less infuscate. Wings subhyaline, never striped. Hind femora below with rather stout spines, often distant or absent. Fore and middle tibiæ below with five pairs of spines. Hind tibiæ above with five spines usually on each side. Abdomen of male with the eighth dorsal segment normal, the ninth more or less hood-like, the hindmargin truncate or

allous-appendiculate. Subgenital lamina of male broad, transverse, medially lobed, laterally with style-like appendages. Ovipositor always nearly straight, very long and slender. Subgenital lamina of female very transverse.

Species all Australian.

I have retained Brunner's genus, and included some new species that appeared to conform to the characters, but doubt whether it can be maintained as more than a subgenus to *Gryllacris*, because the main distinctions appertain to the male sex alone, which is very inconvenient, it not always being possible either to have *both* sexes handy, or to mate individuals correctly, when not caught *in coitu*. Concerning the number of spinelets of the hind femora, it has been shown already that they are too variable even individually to serve as a reliable guide. It is therefore quite possible that some of my species under this genus may have to be transferred to *Gryllacris* upon better acquaintance, and *vice versa*.

Paragryllacris combusta, *Gerstaecker* (Br. Mon., 370, fig. 44*a*).

"Testaceous, shining. Pronotum marked with black. Face deep black, concolorous, or with a yellowish spot. Occiput testaceous, marked brownish. Medial vitta large, trifoliate. Veinlets of elytra paler than membrane.

	Male.	Female.
Length of body ...	32 mm.	37 mm.
Length of pronotum ...	7·5 "	8 "
Length of elytra ...	37 "	38 "
Length of hind femora...	18 "	18 "
Length of ovipositor ...	— "	23–26 "

Habitat.—Sydney, N.S. Wales; Rockhampton, Queensland; Lord Howe's Island."

Paragryllacris infuscata, *Br.* (Mon. 371).

Testaceous. Head deep black (or partly dark brown), except hind margin of cheeks, ocelliform spot, clypeus, labrum and palpi, which are testaceous. Fastigium of vertex one and a-half times to twice as wide as first antennal joint, depressed, margins keeled. Antennæ first and second joints pale, remainder black (or brown). Pronotum testaceous (or brownish), hindmargin black, anterior angles acute (or rounded?). Elytra and wings ample, hyaline, veins and veinlets brownish. Femora all brownish at the apex. Hind femora with four to five spinelets on each margin. Fore tibiæ blackish, except at apex (or only about the knees), spines testaceous. Hind tibiæ above with (four to seven) black (or black tipped) spinelets. Ovipositor not (or not much) longer than hind femora, gradually incurved, acuminate. Sub-

genital lamina of female short, transverse, margins rounded (subsemicircular). Keels wide apart. Subgenital lamina of male hooded (cucullate) in the form of Brunner's type "C." Cerci small, visible from the side above the lateral lobes.

	Male (m.).	Female (m.).	Female (Br.).
Length of body ...	33 mm.	38 mm.	35 mm.
Length of pronotum ...	6·5 "	6·5 "	6 "
Length of elytra ...	38 "	40 "	47 "
Length of hind femora	16 "	15 "	16 "
Length of ovipositor ...	—	33 "	15 " (?)

Habitat.—South Australia: Blakiston *(T. D. Smeaton)*, Adelaide *(Selway)*, (Coll. S.A. Museum), (Adelaide, *Brunner)*.

There is some doubt whether I have correctly assigned my specimens to Brunner's species, but it is the only one which they at all approach in general aspect, and I deem it inadvisable to constitute a new one for their reception.

Paragryllacris callosa, *Br.* (ibid, 371, fig. 44 B).

"Testaceous chestnut. Occiput brown. Fastigium of vertex one and a-half times wider than first antennal joint, flattened. Face and antennæ testaceous. Pronotum concolorous. Elytra acuminate, of smoky colour, also the wings; veins and veinlets brownish, latter 'perfect.' Hind femora below unarmed, or with two to three spinelets. Abdominal segments bordered brownish Eighth abdominal segment of male not produced, ninth segment horizontally produced, triangularly emarginate, on both sides with a very prominent callous tubercle. Ovipositor very long and straight.

	Male.	Female.	Female.
Length of body ...	28 mm.	28 mm.	38 mm.
Length of pronotum ...	6 "	6 "	8·5 "
Length of elytra ...	38 "	28 "	55 "
Length of hind femora ...	16 "	16 "	20 "
Length of ovipositor ...	—	37 "	36 "

Habitat.—Port Denison, Sydney, N.S. Wales; Melbourne, Victoria."

Paragryllacris latelineolata, *Br.* (Mon., 128, fig. 44 C).

Variety (?). Pale yellow. Fastigium of vertex flat, one and a-half times to twice as wide as first antennal joint, margins acute. Face and clypeus rough with impressed dots, testaceous (to dark brownish). Labrum and mandibles reddish ferruginous. Antennæ ferruginous (or first two joints pale). Pronotum with anterior angles produced, somewhat acute, fore and hind margins striped brownish. Elytra subhyaline, veins ferruginous, transverse veinlets bordered darkly very narrowly. Hind femora

below with three to four spinelets on each margin. Knees all brownish. Eighth abdominal segment of male very parabolically produced, ninth segment orange-coloured, much elongated, cucullate, truncate. Subgenital lamina of male transverse, middle lobe short, emarginate, lateral lobes almost as long, styliform, terete. Ovipositor very narrow, slightly incurved; seventh ventral segment of female trapezoidal. Subgenital lamina of female ample, rotundate margin obtuse.

	Male (Br.).	Female (Br.).	Female (m.).	Female (m.).
Length of body ...	33 mm.	36–40 mm.	33·5 mm.	32 mm.
Length of pronotum	6·5 "	7– 8·5 "	6·5 "	6·5 "
Length of elytra ...	38 "	40–46 "	36 "	38 "
Length of hind femora	17 "	20–22 "	13 "	15 "
Length of ovipositor	—	40 "	43 "	42 "

Habitat.—South Australia: Vicinity of Adelaide (Coll. S.A. Museum). Melbourne (*Brunner*).

The two specimens in the South Australian Museum are doubtfully included in this species as a variety. The bracketted parts of the above description denote the differences. Some ova were obtained from one specimen. They are brown, elongate-elliptical, 4·5 mm. long by 1·3 mm. wide, and ornamented by regularly arranged microscopical impressions.

Paragryllacris pallidolinea, *spec. nov.*

Size moderate or large. Brownish testaceous. Head globose from front view; occiput high. Face, clypeus and cheeks rugose, pale, almost whitish testaceous. Labrum ferruginous. Ocelliform spot pyriform. Frontal fastigium deeply sulcate laterally, apex separated from fastigium of vertex by a straight line. Fastigium of vertex about twice as wide as first antennal joint, much rounded, prominent, shining, with a *pale, somewhat sinuous, medial line, indistinct, pale, cerebriform reticulations all over it and extending to occiput;* posterior margin of the latter pale. Pronotum stout; fore and hind margins more or less broadly blackish, an acute prolongation of the anterior blackish band accompanying the impressed medial to about the middle; fore and hind margins nearly straight; lobes much longer than high, margins nearly straight, angles rounded. Dorsal abdominal segments with obscure posterior margins. Elytra ample, veins and veinlets brown, membrane much paler. Wings slightly exceeding elytra, veins ferruginous, transverse veinlets rather irregular, pale, often with a very narrow dark medial line and bordered narrowly with brownish on each side; membrane similar to elytra. Legs of body-colour, knees more or less dark. Hind femora stout, base very much incrassated, with a deep medial longitudinal furrow, below with three to four (male) or five

(female) external and five (male) or four (female) internal spinelets. Hind tibiæ above with three to four spinelets on each margin in both sexes. Ninth abdominal segment of male hooded (type "C" of Brunner). Subgenital lamina of male with *four lobes of subequal length and width.*

	Male.	Female.
Length of body ...	... 31 mm.	38 mm.
Length of pronotum	... 5·5 "	6·5 "
Length of elytra ...	... 36 "	40 "
Length of hind femora	... 15 "	18–29 "
Length of ovipositor	... —	35–40 "

Habitat.—Vicinity of Adelaide, South Australia; three specimens.

Variety.—Minor. Resembling the above, but smaller.

	Male.	Female.
Length of body	... 27 mm.	28–30 mm.
Length of pronotum	... 5·5 "	6·5 "
Length of elytra	... 35 "	38 "
Length of hind femora	... 15 "	17–18 "
Length of ovipositor	... —	38 "

Habitat.—Neighbourhood of Adelaide; three specimens. (Collection S. A. Museum).

Paragryllacris exserta, *Br.* (Mon., 372).

"Differs from *P. latelineolata* in smaller size, brownish colour, and the transverse veinlets of the wings being narrowly circumscribed with brownish. Hind femora below with four internal and five external spinelets. Abdomen of male with the *last dorsal segment less produced.* Subgenital lamina with the medial lobe longer, *lateral lobes narrow, exsertedly produced.*

	Male.
Length of body...	... 28 mm.
Length of pronotum	... 5·8 "
Length of elytra	... 38 "
Length of hind femora... ...	... 15 "

Habitat.—Queensland."

Paragryllacris lobata, *Br.* (ibid).

"Testaceous chestnut colour. Face brownish, very rugose with impressed dots. Ocelliform spot orbicular, citron yellow. Labrum and mandibles ferruginous. Elytra and wings smoke-coloured, transverse veinlets very narrowly bordered with brownish. Hind femora below, with six internal and three to four external spinelets. Abdomen of male with last segment moderately produced, chestnut-coloured, ninth segment ending in two very short spines.

	Male.
Length of body	30 –43 mm.
Length of pronotum	6·5– 8 "
Length of elytra	42 –44 "
Length of hind femora	19 –20 "

Habitat.—Rockhampton, Queensland."

PARAGRYLLACRIS MODESTA, *Br.* (ibid).

"Size small, deep brownish-testaceous. Fastigium of vertex *scarcely wider than the first antennal joint, angles keeled.* Face smooth. Pronotum with anterior angles obtuse. Elytra and wings smoky, veins and veinlets brown. Hind femora below with six internal and four external spinelets. Abdomen with last segments scarcely produced, ninth ending in two spines. Subgenital lamina with middle lobe tridentate, lateral lobes very narrow, longer than the middle.

	Male.
Length of body	24 mm.
Length of pronotum	5 "
Length of elytra	34 "
Length of hind femora	14·5 "

Habitat.—Port Adelaide, South Australia."

PARAGRYLLACRIS INSIGNIS, *spec. nov.*

Size small. Pale testaceous. Head oval from front view, slightly depressed, *all parts,* except the eyes, *of body colour.* Fastigium of vertex tumid in front, about twice as wide as first antennal joint. Antennæ about three times the length of body. Pronotum somewhat saddle-shaped, disk broad, flat, behind slightly depressed medially, constricted only near foremargin; lobes subquadrangular, angles rounded, margins straight, callosities scarcely developed; hind margin with a dusky border. Elytra broad, acuminate, veins pale ferruginous. Wings somewhat shorter, veins pale, membrane of both elytra and wings very pale and pellucid. Fore and middle tibiæ with second spine longest, concolorous. Hind femora below with four external, and five to six internal blackish-tipped spinelets. Hind tibiæ above with four external and three to four internal spinelets. Abdomen of male with *ninth segment enlarged, tumid* (resembling Brunner's type "A," but the subgenital lamina in the form of type "C"). Subgenital lamina of male with *medial lobe deeply emarginate, lateral lobes styliform.*

	Male.
Length of body	24 mm.
Length of pronotum	3·5 "
Length of elytrya	40 "
Length of hind femora	12 "

Habitat.—Western Plains, South Australia *(A. J. Percy)* (in Coll. S.A. Museum).

The species differs from others chiefly, by the want of colour marks, and the peculiar structure of the last abdominal segment, besides size and other details.

PARAGRYLLACRIS DESERTA, *spec. nov.*

Resembling *P. latelineolata*, Br. Size small. Pale testaceous. Fastigium of vertex *slightly carinate in front*, more than twice as wide than the first antennal joint; margins acute, subcarinate. Face and clypeus very rugose from impressed dots, testaceous. Medial ocelliform spot oval, citron coloured, laterally above two small ones testaceous. Labrum testaceous, above with a piceous triangular spot. Mandibles piceous to black. Antennæ pale ferruginous testaceous. Pronotum with the disk marked by a short black wedge-shaped streak in front and behind, bordered broadly piceous; lobes with anterior angles rounded. Elytra subhyaline, veins pale ferruginous. Wings similar, veins very narrowly bordered brownish. Hind femora below with *three spinelets on* each margin, knees brownish. Hind tibiæ above with five spinelets on each margin. Tibiæ of all the legs more or less blackish near the middle, apices indistinctly dark coloured. Abdomen with eighth and ninth segments *pilose*, otherwise resembling *P. latelineolata*. The subgenital lamina of the male also resemble those of that species, but the lateral lobes are *distinctly and unequally divided at the apex*, forming a shorter, broader, medial lobelet, and slender, styliform, lateral lobes.

	Male.
Length of body	28 mm.
Length of pronotum	3·5 "
Length of elytra	32 "
Length of hind femora	9·5 "

Habitat.—Cootanoorina, interior of SouthAustralia, where it was captured by Mr. R. Helms in June, 1891 (Coll. S.A. Mus.).

NEANIUS, *Brunner* (Mon., 373, fig. 45).

Body subapterous. Head large, as wide as pronotum. Vertex rounded, fastigium about twice as wide as first antennal joint. Pronotum smooth, shinning, anterior angles rounded, hindmargin subemarginate. Elytra and wings rudimentary. Hind femora below with numerous spines. Fore tibiæ below with four spinelets on each side. Abdomen with ninth segment of male hood-like. Subgenital lamina of same transverse, middle lobe narrowly produced, lateral styles free. Ovipositor slender, slightly incurved. Species Australian and Asiatic.

NEANIUS LOBATUS, *Br.* (ibid).

"Testaceous. Face pale. Elytra with lobes rather broad, reaching to the hindmargin of the metanotum. Subgenital lamina of male broad, middle lobe narrow, dilated and bilobed at the apex.

	Male.
Length of body	17 mm.
Length of pronotum	5 "
Length of elytra	3·6 "
Length of hind femora	12 "

Habitat.—New Guinea."

The only other species known, *N. squamosus*, inhabits Ceylon.

EONIUS, *gen. nov.*

Subapterous. Head much wider than pronotum, occiput elevated, vertex rounded. Fastigium broad, apical part keeled. Antennæ twice longer (more or less) than the body. Pronotum smooth, shining; anterior angles rounded; hindmargin slightly concave. Elytra and wings very rudimentary. Fore and middle tibiæ below with three pairs of large spinelets, and one or two pairs of smaller apical spinelets. Hind femora below spinulose. Hind tibiæ above flat, and usually armed with four spinelets. Ovipositor slender straight, apex straight above, acuminate from below, acute.

The genus appears to be allied partly to *Neanius*, and partly to *Apotrechus*, but differs from the former in the very large head, broad fastigium, and long straight ovipositor, and from the latter in having rudimentary elytra, the pronotum wider behind, the hind tibiæ flat above, and the ovipositor being longer than the body. Its place in the system is indicated by the following synopsis:—

5. Elytra rudimentary, lobelike. Fore tibiæ with four pairs of spines.
   6. Size small. Occiput slightly elevated. Lobes angular. Antennæ long. Hind femora with numerous spines. Hind tibiæ with four spines on each margin. Ovipositor shorter than the body *Neanius.*
   6.6. Size large. Occiput much elevated. Lobes rounded. Antennæ short. Hind femora with two to three spines on each side. Hind tibiæ with four spines usually on each side. Ovipositor as long or longer than body. *Eonius.*

EONIUS TIGRINUS, *spec. nov.*

Size large. Yellow to testaceous, banded with black. Head oval from front view. Face black or piceous, almost smooth,

shining, with numerous fine oblique and irregularly transverse lines visible only with a lens. Frontal fastigium hexagonal, bounded below by an elbowed (paler or darker) impression and a straight line. Ocelliform spot round or oval, whitish. Clypeus subtransverse, lower part brownish. Labrum large, almost round, brownish. Fastigium of vertex about twice the width, or more, of first antennal joint, depressed, carinate in front, elevated and rounded above, deep castaneous with indistinct, pale, medial line. Antennæ less than twice the length of body, very slender, pale. Pronotum convex in front, concave behind, fore and hind margins black, lobes callous, almost as high as long, angles much rounded, inferior margin straight. Elytra and wings quite rudimentary. Hind femora with two to three spinelets on each margin below. Hind tibiæ above with *four spinelets on each margin.* Legs and tarsi of body-colour. Abdominal segments posteriorly bordered with deep brown or blackish. Cerci of female short. Ovipositor long, shining, yellow, apex black. Subgenital lamina transverse, very short, entire. One adult and one female nymph.

	Female—Adult.	Nymph.
Length of body	41 mm.	27 mm.
Length of pronotum ...	6·5 "	5 "
Length of elytra... ...	2 "	1·5 "
Length of hind femora ...	15 "	15 "
Length of ovipositor ...	45 "	20 "

Habitat.—Mannanarie, Northern District of South Australia. (*Driffield*, in collection of S.A. Museum).

The adult specimen was reported to have been captured in an uninhabited hut; the nymph is a spirit specimen, dried and much distorted, from an unrecorded locality, but most probably from the Far North of this province. The eggs taken from the specimen are elongate elliptical, nearly white, and 5 mm. long. About 22 were secured.

Eonius atrifrons, *spec. nov.*

Size moderate. Testaceous. Head oblong-oval from front view, of body-colour except a *patch of deep shining black, round, outline undefined*, occupying the greater part of the face, including the bases of the antennæ, apex of fastigium and upper part of clypeus. Ocelliform spot small, oval. Pronotum with fore and hind margins black. Abdominal segments broadly black behind. Legs short, pale, concolorous. Hind femora below with five to six internal and four to five external spinelets. Hind tibiæ above with *six internal and three internal spinelets.*

	Female.
Length of body...	24 mm.
Length of pronotum	6 "
Length of elytra	2·5 "
Length of hind femora	14 "
Length of ovipositor	15 "

Habitat.—Leigh Creek, Far North of South Australia (Coll. S.A. Museum.)

EONIUS FUMATUS, *spec. nov.*

Size moderate, Smoky-brown, indistinctly banded. Head small. Vertex low, *dark brownish*. Face, bases of antennæ, and legs pale. Ocelliform spot obsolete. Pronotum with hind margin only blackish. Legs slender. Fore tibiæ below with five spines on each side. Hind femora below with three slender spinelets on each side. Hind tibiæ flat above, with six external and four internal spinelets. Ovipositor moderately incurved, apex acute. Subgenital lamina of female broad, semi-circular, entire, with a narrow, deep black band near its posterior margin.

	Female.
Length of body	23 mm.
Length of pronotum	5 "
Length of elytra	3 "
Length of hind femora	14 "
Length of ovipositor	32 "

Habitat.—Kingston, South-Eastern part of South Australia (*D. Redman*, in collection of S. A. Museum).

EREMUS, *Brunner* (Mon., 374, fig. 46).

"Size mostly small. Wingless. Head large, usually as wide as the pronotum. Fastigium of vertex wider than the first antennal joint. Hind femora spined below, rarely unarmed. Fore tibiæ below armed with four rather large spines. Abdomen of male with ninth segment produced or hood-like. Subgenital lamina of male broad, with free styles. Ovipositor variable in length, acuminate or obtuse.

Habitat.—Asia, Africa, and Australia ; 12 species known."

EREMUS SPINULOSUS, *Br.* (ibid, 377).

"Size large. Pale testaceous, ferruginous above. Head very large, shiningly ferruginous, occiput pale or infuscate. Pronotum unmarked. Hind femora below with very small crowded spinelets on both sides.

	Male.	Female.
Length of body	36 mm.	39 mm.
Length of pronotum ...	7·5 "	7·7 "
Length of hind femora ...	17 "	18·5 "
Length of ovipositor ...	—	18·5 "

Habitat.—Fiji Islands"

EREMUS MUELLERI, *Br.* (Man., 378).

"Size small. Testaceous, head brownish. Pronotum with the lobes scarcely deflected, angles obtuse. Hind femora below with four external and three internal (smaller) spinelets. Hind tibiæ above with five very small spinelets on both margins.

	Female.
Length of body...	14 mm.
Length of pronotum	3·8 "
Length of hind femora...	9 "
Length of ovipositor	8 "

Habitat.—Queensland."

EPACRA, *Brunner* (Mon., 381, fig. 48).

"Habit of *Gryllacris*. Head elongate from front view. Fastigium of vertex rather narrower than first antennal joint. Eyes large, reniform. Antennæ very long. Elytra and wings very large, straw-coloured, as well as the veins, hyaline. Pronotum truncate in front and behind, with deep sulci; meso- and meta-notum acute or lobed. Hind femora slender, armed below with more or less stout spines. Hind tibiæ above with seven spinelets on each margin. Ovipositor long, scarcely incurved. Limited to Australia."

EPACRA AENEA, *Br.* (ibid, 382).

"Straw-coloured ferruginous, face brassy black. Fastigium with raised, keel-like margins, Antennæ, knees, clypeus, and palpi ferruginous. Meso- and meta-sternal lobes triangular, acuminate. Hind femora below with four strong black spines towards the apex, and four small ones towards the base internally, and six strong spines externally.

	Male.	Female.
Length of body	29 mm.	29 mm.
Length of pronotum ...	6 "	6 "
Length of elytra	44 "	48 "
Length of hind femora ...	16 "	18 "
Length of ovipositor ...	— "	21 "

Habitat.—Rockhampton, Cape York, Queensland."

EPACRA MODESTA, *Br.* (ibid).

"Face brownish, labrum straw-coloured. Pronotum not striped. Meso- and meta-sternal lobes acute, rotundate. Tibiæ brownish at the base. Hind femora below with very small spinelets (four to five on external margin). Ovipositor nearly straight, apex acuminate.

	Female.
Length of body	32 mm.
Length of pronotum	5·8 "
Length of elytra	44 "
Length of hind femora...	14 "
Length of ovipositor	19 "

Habitat.—Cape York, Queensland."

Apotrechus, *Brunner* (Mon., 383, fig. 49).

"Size large. Wingless. Head much wider than pronotum; occiput rounded, elevated. Fastigium very broad. Eyes small. Pronotum wider in front than behind, anterior angles produced. Hind femora slender, scarcely armed below. Fore and middle tibiæ below with three to four spines. Hind tibiæ terete, smooth, or nearly so. Abdomen of male with ninth dorsal segment produced, hood-like. Subgenital lamina of male transverse, without styles. Ovipositor short, stout, incurved. *Gryllacris*, Erichson, Gerstaecker."

Apotrechus ambulans, *Erichson* (ibid).

"Size *moderate*. Testaceous. Disk of pronotum and succeeding segments dark reddish-brown, excepting the hind margin. Head testaceous above, a large part of face brownish, ocelliform spots pale yellow, medial one nearly round. Thoracic segments with a continuous yellow medial line. Hind femora below with two to three short spines on each side. Hind tibiæ wholly unarmed, terete. Ovipositor stout, *longer than hind femora*, slightly incurved, obtusely acuminate.

	Male.	Female.
Length of body	22 mm.	29 mm.
Length of ovipositor ...	—	17 "

Habitat.—Tasmania."

Apotrechus unicolor, *Br.* (ibid, 140).

"Size *small*. Testaceously ferruginous. Face brownish, rough, with horizontal folds, ocelliform spots absent. Pronotum ferruginous, disk uneven. Hind femora below with two spines towards apex. Hind tibiæ flat below. Ovipositor very short, scarcely extending beyond the cerci, acuminate.

	Male.	Female.
Length of body	35 mm.	42 mm.
Length of pronotum ...	7 "	8 "
Length of hind femora ...	14 "	17·5 "
Length of ovipositor ...	—	5 "

Habitat.—Port Denison, N.S. Wales."

Apteronomus, *gen. nov.*

Size small. Wingless, or wings scale-like. Head moderately large, not much wider than pronotum; occiput rounded. Fastigium nearly twice as wide as first antennal joint, vertex depressed, carinate. Pronotum equally as wide in front as behind, lobes rounded. Eyes small, elliptical. Hind femora with very small spinelets. Fore tibiæ below with five spines on each side. Hind tibiæ flattened, spinelets very minute. Abdomen of male with ninth dorsal segment rather short; supra-anal and subgenital laminæ prominent, latter narrow, acutely triangular, deeply cleft. Styles distinct.

The following synopsis will indicate the place in the system occupied by this genus:—

4.4. Body wingless, or lobes quite rudimentary. Head broader than pronotum. Occiput elevated.

5. Size large. Head much wider than pronotum. Fastigium very broad, subrotundate. Fore tibiæ below with three to four spines on each side. Abdomen of male with ninth dorsal segment produced, hood-like. *Apotrechus.*

5.5. Size small. Head not much wider than pronotum. Fastigium rather narrow, depressed in front, keeled. Fore tibiæ below with five pairs of spines. Abdomen of male with ninth dorsal segment short, not hood-like. *Apteronomus.*

Apteronomus Bordaensis, *spec. nov.*

Testaceously-brown, banded indistinctly darker. Head pale, face almost concolorous. Ocelliform spot pale testaceous, partly bordered with brown, with two pale spots below apex of fastigium. Clypeus trapezoidal, quadrangular, narrower below, as wide above as high. Labrum elongate-oval, ferruginous. Fastigium of vertex narrow, widely separated from the antennæ, margins angular, parallel, scarcely keeled, without lateral pale marks, apex semicircular, dark-brown. Antennæ concolorous, three times the length of body. Pronotum rounded above, shiningly smooth, fore margin convex and raised, hind margin concave; lobes nearly as high as long, angles much rounded, margins narrowly incurved. Hind femora below with five internal and two to four external minute spinelets. Hind tibiæ flattened above, with five internal and four to five external spinelets. All the legs (also the antennæ) closely covered with short tomentum. Subgenital lamina of male narrowly triangular, deeply cleft, lateral lobes none.

	Male.
Length of body	14–16 mm.
Length of pronotum...	2·5– 3 "
Length of hind femora	15 "

Habitat.—Western extremity of Kangaroo Island, near Cape Borda, where two males were captured by myself at the end of February, 1886, and were found under the loosely adhering bark of the trunk of Eucalypts in moist situations. A third specimen resembling the above two in most characters, but exhibits minute scale-like wing-lobes, is for the present included. Its face is marked with a broad blackish-brown band, and the hind femora are wholly unarmed. Collection of S. A. Museum.

AMETRUS, *Brunner* (Mon., 384, fig. 50).

"Head with occuput elevated. Fastigium of vertex three times wider than first antennal joint. Antennæ short, slender. Face broad, rounded, Pronotum short, anterior angles obtuse, hindmargin obtusely and triangularly emarginate, transverse furrows deeply impressed. Elytra and wings rudimentary, lobe-like and lateral. Fore coxæ much compressed, spined. Hind femora below with internal margin wholly and external partly spined. Fore and middle tibiæ below with two spines on each side. Hind tibiæ long, very thick, terete, above with six spines on each side, those on the inner side being the longer ones. Tarsi very short. Abdomen of male with ninth dorsal segment hood-like, short, inferior margin triangularly emarginate. Cerci very short. Subgenital lamina quadrate, medial lobe obtuse, produced, lateral lobes accuminate, styles none.

AMETRUS TIBIALIS, *Br.* (ibid).

"Size moderate. Uniformly ferruginous.

	Male.
Length of body...	29 mm.
Length of pronotum	5·2 "
Length of elytra	3 "
Length of hind femora...	14·7 "
Length of hind tibiæ	16 "

Habitat.—Melbourne, Victoria."

AMETROSOMUS, *gen. nov.*

Head with occiput elevated, maxillary palpi very long, filiform. Antennæ about three times the length of the body. Fastigium of vertex scarcely twice as wide as first antennal joint, apex depressed, margins keeled. Eyes large, reniform. Pronotum short, anterior margin raised, disk with a distinct suborbicular callosity on each side, angles much rounded, hindmargin almost

flat, broadly and triangularly emarginate; posterior lateral callosities large, oval; lobes high, inferior margin subemarginate, posterior angles truncate. Elytra and wings lobelike, very narrow. Anterior coxæ subquadrangular, unarmed. Fore and middle legs much compressed, with five spines on each margin. Hind femora below with three to six internal and three to eight external minute spinelets (being different on the right and left side of the same specimen). Hind tibiæ slender, flattened above, with nine to ten internal and five to seven external, very minute spinelets. Ovipositor very short, much incurved, apex obtuse, rounded. Subgenital lamina of female broadly transverse, very short, entire, posterior margin subsemicircular.

The insect has the aspect of *Ametrus*, Br., but is quite different in many points, as shown by the following synopsis, which, at the same time, indicates the place of the genus in the system. The numbers refer to those in Brunner's Monograph, 1888.

3.3. Hind tibiæ spined. Tarsi very short. Elytra and wings lobelike.

4. Hind tibiæ much incrassated. Fastigium of vertex broad. Antennæ short. Fore and middle tibiæ below with two-three spines on each side. *Ametrus.*

4.4. Hind tibiæ slender. Fastigium narrow. Antennæ long. Fore and middle tibiæ with five spinelets on each side. *Ametresomus.*

Ametrosomus Helmsi, *spec. nov.*

Size moderate. Colour brownish, with dark brown bands. Face pale. Ocelliform spot circular, cream-coloured. Clypeus subsemicircular. Legs slender, pale. Two specimens.

	Female.
Length of body	27 mm.
Length of pronotum	5 "
Length of elytra	2 "
Length of hind femora	14–16 "
Length of ovipositor	3·5 "

Habitat.—Blyth Hills and Barrow Range, Central Australia, captured by Mr. R. Helms (Coll. S.A. Mus.).

B. STENOPELMATIDÆ.

The Stenopelmatidæ differ from all other Locustodea in the form of the tarsi, these being *compressed* instead of depressed, and the first and second joints do not possess any lateral lobes, so greatly developed in the Gryllacrids. Another character serves to separate them into two main groups, viz., the presence or absence of pulvilli (cushions) on the underside of the tarsi, the an-

terior and posterior one possessing one, and the metatarsus two. Intimately connected with this character is another observable in the structure of the base of the hind femora. In all those species which are furnished with pulvilli the hind femora are jointed to the coxæ by an intruding angle plainly visible from the *outside*, but in those without pulvilli the base of the femora is rounded and the angle only seen from the inside.

A second most important distinction consists in the presence or absence of foramina, or auditory organs, of the fore tibiæ, which, when present, are always open on both sides, except in one of the new genera, where they are quite rudimentary.

The form, arrangement, and number of the spines of the legs provide also excellent characteristics within certain limits, but being variable, sometimes not only in the various individuals but even on the right and left sides of the same insect, cannot be considered as of decisive value alone.

The genital characters are very peculiar, and sometimes of extravagant forms, baffling adequate description in words.

The ovipositor is usually of the normal structure among the members of the tribe, and affords good specific distinctions in some cases.

The fastigium of the vertex is also very useful in diagnosing. It merges either gradually into the face without distinct demarcation, or is set off more or less distinctly. Its width and markings are also important as specific distinctions.

The antennæ and mouth parts are unsuited for systematic use, notwithstanding their great, and sometimes enormous, development; being mostly of a very uniform or variable type.

The form, etc., of the clypeus and labrum, appear to deserve considerable attention.

The pectus or chest is either very narrow or very broad and flat (in rare cases), but offers little or nothing feasible to base good distinctions upon.

Organs of flight are mostly absent, but when present they resemble those of crickets to a great extent in their structure.

The presence of auditory organs in part of the family naturally suggests the possession of corresponding organs for producing sounds. These are, apparently, to be sought for in the roughened surfaces of some of the basal segments of the abdomen. Several varieties of structure have been observed.

The habits of these insects, being extremely retired and wholly nocturnal, are little known. All of the cave-inhabiting Orthoptera belong to this family, and in some cases it has been observed that the eyes have become atrophied or wholly obsolete. Other species live in burrows under stones, logs of wood, or under loose bark and in hollows of trees. On account of their formid-

able mandibles they can inflict painful bites, and are not pleasant to encounter incautiously. Their food consisting mainly, if not entirely, of self-caught insects, they must be regarded as being more or less beneficial to man, and not hurtful.

Owing to the paucity of material, most probably due to the rarity of representatives of the family, I shall content myself for the present by offering only a synoptical key, collated principally from that of Brunner van Wattenwyl in his monograph of 1888, and descriptions of three new species belonging to two new genera.

SYNOPSIS OF AUSTRALIAN AND POLYNESIAN STENOPELMATIDÆ.

1. Tarsi with pulvilli, metatarsus with two. Angle of insertion of hind femora visible laterally from outside. SECTION A.

2. Anterior margin of pronotum straight or rounded, without submarginal furrow. Fastigium of vertex separate from frontal, more or less produced between the antennæ. Anterior coxæ armed with a spine. Middle tibiæ below spinulose.

3. Fore tibiæ with foramina on both sides, or rarely on the internal margin. (One Madagascar genus, *Hypocophus*, only). ANASTOSTOMATÆ.

4. Hind tibiæ flattened above, with three to four spines (dilated at the base) on each side. Fore tibiæ smooth above. Wingless. DEINACRIDA, *White (Br.* Mon., 268, fig. 5).

a. Pronotum shining. Hind femora always with some apical spines on each margin. Middle tibiæ above unarmed, excepting the apical spines. Hind tibiæ with a fixed small spur.

b. Pronotum lurid, striped with brown. Abdomen chestnut-coloured. Cerci of male somewhat terete. Hind tibiæ with three spines on the external margin besides the apical ones. New Zealand. *D. thoracica*, White.

bb. Pronotum brown. Abdomen lurid, each segment banded brown at base and apex. Cerci of male depressed. Hind tibiæ externally with four spines besides the apical. New Zealand. *D. ligata*, Brunner.

aa. Pronotum very rough. Hind femora spined on both sides. Middle tibiæ above with two spines on external margin, besides apical. Hind tibiæ with large articulately inserted spurs. New Zealand. *D. heteracantha*, White.

4.4. Hind tibiæ above rounded with numerous spines, not dilated.

5. Vertex compressed (seen from above). Fastigium not so wide as first antennal joint, sulcate. Occiput rounded, not carinate. Pronotum truncate behind. Fore tibiæ above flat or terete. Tarsi without arolia between the claws. Femoral knee-lobes all spined. ANASTOOTOMA, *Gray* (*Br.* Mon., 270, fig. 6).

a. Size large. Colour chestnut, dusky. Femora all spined below. Hind femora roughly granulated all over. Queensland, New Zealand, New South Wales. *A. Australasiæ*, Gray.

aa. Size small. Reddish piceous. Fore and middle femora below unarmed, or nearly so. Hind femora spined above.

b. Colour bright. Hind tibiæ above with seven spines on each side. Ovipositor scarcely exceeding the cerci. Queensland, New South Wales. *A. erinaceus*, Burmeister.

bb. Colour dull. Hind tibiæ above with eight to nine spines. Ovipositor scarcely shorter than hind femora. Queensland. *A. opacum*, Brunner.

5.5. Vertex flat (seen from above). Fastigium as wide or wider than the first antennal joint, not sulcate, flat, of equal width throughout or contracted towards the apex, contiguous with the frontal in a line, not produced.

6. Subgenital lamina of male transverse, styles flat.

7. Fore tibiæ with internal margin bispinose above. Wingless.

8. Head of male as broad as pronotum, mandibles extremely large. Fastigium depressed, not narrowed at the apex, contiguous with the frontal in a line.

CARCINOPSIS, *Br.* (Mon., 275, fig. 9).

a. Wingless. Hind tibiæ with first and second internal spurs short, subequal in length. Australian species.

b. Legs concolorous. Vertex high. Fastigium not as wide as first antennal joint. New Caledonia. *C. unicolor*, Brunner.

bb. Femora and tibiæ banded brown towards the apex. Vertex depressed. Fastigium wider than the first antennal joint. New Caledonia. *C. signata*, Brunner.

aa. Winged species. India ; not Australian.

8.8. Head never as wide as pronotum, mandibles normal. Fastigium contracted at the apex, acuminate, contiguous with the frontal. AISTUS, *Brunner* (Mon., 278, fig. 10).

Monotypic. Size small, chestnut-coloured, shining. *A. gracilis*, Br.

6.6. Subgenital lamina of male elongate, styles narrow.

7.7. Fore tibiæ above terete, internal margin below with three to five spines. Hind tibiæ shortly spinulose. Second spur as long or longer than the first.

8. Fore tibiæ with foramina on both sides. Second internal spur of hind tibiæ scarcely as long as the first. Australian species.

9. Foramina distinct. Hind femora extending much beyond the body. Fore tibiæ with three spines on the internal margin.

TRIHOPLOPHORA, *Br.* (Mon., 280, fig. 13).

Monotypic. Piceous, sides and underside pale. Face pale, marbled with piceous. Eastern Australia. *T. abnormis*, Brunner.

9.9. Foramina rudimentary. Hind femora scarcely exceeding the body. Fore tibiæ with five spines on the internal margin.

PENTHOPLOPHORA, *Tepper*.

Monotypic. Yellowish testaceous. Pronotum and abdomen banded black. Central Australia. *P. Driffieldi*, Tepper.

8.8. Foramina on internal margin only. Madagascar genus.

33. Fore tibiæ without foramina. MIMNERMI.

4. Fastigium rounded or flattened, not sulcate. Hind tibiæ slender, with short spines. (Elytra abbreviated). Five African genera.

4.4. Fastigium deflexed between the antennæ, compressed, sulcate. Hind tibiæ stout, above with strong spines. Australian and American genera.

5. Head not wider than pronotum. Fastigium not as wide as first antennal joint. Hind tibiæ above with two spines on internal margin. Lobes of pronotum very low, angular. American species. CRATOMELUS, *Brunner* (ibid, fig. 24).

5.5. Head wider than pronotum. Fastigium about four times as wide as first antennal joint. Lobes of pronotum high, rounded. Hind tibiæ above not spined. Australian species.

PACHYPODAGRUS, *Tepper*.

a. Size large. Brownish ferruginous, banded with brown. Hind femora below with 12 internal and four to six external spines. Ovipositor long. *P. crassipes*, Tepper.

aa. Size moderate. Greyish-testaceous, concolorous. Hind femora below with six internal and no external spines. Ovipositor short. *P. Magareyi*, Tepper.

2.2. Pronotum wider in front, narrower behind, fore margin sinuous, intramarginal furrow distinct, &c. Extra-Australian genera. STENOPELMATUS, &c.

1.1. Tarsi without pulvilli (except one American genus, *Gammarotettix*, with one pulvillus on the metatarsus), very much compressed. Angle of insertion of the base of the hind femora visible only on the *inner* side. Bases of antennæ approximate. Fore tibiæ without foramina. SECTION *B*.

2. Fore and middle femora with movable spines at the apex. Hind tibiæ above with crowded spines of equal length, below terete and unarmed. Asiatic and Australian species.

RAPHIDOPHORÆ.

3. Fore femora with a movable, rather large spine on the inner side at the apex. Malayan and Australian species.

RAPHIDOPHORA, *Serville* (Br. Mon., 294, fig. 25).

a. Hind metatarsus above unarmed and smooth (except apical spine). Spines of the knees of the anterior femora long. Hind femora below spined on the inner margin. Antennæ stout. Australia. *R. crassicornis*, Brunner.

a. Hind metatarsus above hirsute and spined. Abdomen with seventh dorsal segment obtusely produced. New Guinea. *R. foeda*, Brunner.

3.3. Fore femora with small spines on both sides of the apex. Eyes very prominent seen from above. First spur on internal margin much shorter than the metatarsus.

NEONETUS, *Br.* (Mon., 300, fig. 27).

Size very small. Testaceous, variegated with brownish. Monotypic. New Zealand. *N. variegatus*, Brunner.

2.2. Fore and middle femora unarmed at the apex, or with only a few spinelets. European, American and Australian genera.

3. Hind tibiæ above with one of the spinelets usually remote from the others, which are crowded, below terete, rarely spined. DOLICHOPODÆ.

4. Antennæ slender. Styles absent. European species.

4.4. Antennæ incrassated, contiguous at the base. Subgenital lamina of male lanceolate, styles present. New Zealand species. PACHYRHAMMA, *Br.* (Mon., 301, fig. 29).

a. Fore femora below unarmed, hind ones very narrowed, about one and a half times the length of the body. *P. Edwardsi*, Scudder.

aa. Fore femora below with three or four small spinelets on the anterior margin. Hind femora scarcely longer than the body, base incrassated. *P. Nova-zealandiæ*, Br.

3.3. Hind tibiæ above with most of the spines remote from each other, also the spinelets small or tooth-like rarely crowded. One European, five American, and one Australian genus. CEUTEPHILI.

4. Hind tibiæ below with crowded spinelets, sulcate. Europe. TROGLOPHILUS, *Krauss.*

4.4. Hind tibiæ below with distant spinelets, terete. All American and Australian species.

5. Hind tarsi above with first and second joints hirsute or with two rows of spinelets. Antennæ fasciculately pilose beyond the middle. American genus. HETEROMALLUS, *Br.* (Mon., fig. 35).

5.5. Hind tarsi above with first and second joints unarmed or shining, except the apex of the latter. New Zealand. TALITROPIS, *Bollen* (Br., Mon., 312, fig. 36).

Monotypic. Shiningly ferruginous. Rather small. *T. Sedilloti*, Bollen.

PENTHOPLOPHORA,* *gen. nov.*

Head elongate. Vertex produced beyond the eyes. Fastigium rounded, narrow towards the apex. Medial ocelliform spot, minute, annular, indistinct, *lateral spots absent.* Antennæ scarcely *one and a half times* the length of the body. Eyes large, reniform, depressed. Face flat. Clypeus transverse. Labrum obovate, longer than wide, base stout. Mandibles covered. Palpi very slender. Pronotum rounded, lobes higher than long, highest behind, inferior sub-semicircular. Fore coxæ

* Five-armed,

very stout, spined. Femora sulcate below. Hind femora much dilated at the base, not longer than the body. Foramina of fore tibiæ *quite rudimentary* (notably posteriorly), terete above, below *with five spines on each margin.* Hind tibiæ above with two long terminal spurs inside, and with four short ones externally, also below one on each side. Abdomen stout, cylindrical, segments not granulose. Cerci of female very slender, shorter than supra-anal lamina. Subanal valves elongate-oval. Ovipositor slender, gradually incurved, acuminate from below, apex very acute. Subgenital lamina broad, nearly semicircular.

The large insect, for whose reception the genus is established, differs too much from all others to admit of its inclusion in *Trihoplophora*, its nearest ally, as will be seen by inspecting the synoptical key.

PENTHOPLOPHORA DRIFFIELDI, *spec. nov.*

Size large. Yellowish testaceous. Head concolorous, except a small blackish spot on each external superior angle of clypeus. Eyes black. Pronotum with anterior and posterior margins broadly black. Abdominal segments banded blackish.

	Female.
Length of body	35 mm.
Length of pronotum	6·5 "
Length of hind femora	16 "
Length of ovipositor	37 "

Habitat.—Angebuckina in the Far North of South Australia, whence this remarkable insect was brought by my friend, the late C. E. Driffield, to whose memory it is dedicated. Collection S.A. Museum.

The rudimentary foramina render this species very interesting, connecting those species without them directly with the others which possess them in a perfect form. On the anterior side they are tolerably distinct, although small, and denoted by brownish shading, but on the opposite side are only indicated by a minute impression.

PACHYPODAGRUS,* *gen. nov.*

Head distinctly wider than pronotum, oval. Occiput elevated. Vertex declined. Fastigium rounded, slightly sulcate, three to four times wider than the first antennal joint. Medial ocelliform spot small, circular, not very distinct, lateral ones inconspicuous or absent. Antennæ very slender, not much longer than the body. Eyes large, *elliptical*, depressed. Pronotum cylindrical, sulci deep, lobes high, inferior margin semicircular. Elytra ab-

* Thick-gouty.

breviate, veins distinct. Wings scale-like. Mesosternal lobes short broad, metasternal large rounded. Femora all sulcate below. Hind femora incrassated, pinnate striæ biserial and indistinct, upper margins smooth, lower margins spined. Fore tibiæ stout, above terete, spineless, without foramina, below with four to five external and three internal spinelets. Hind tibiæ *very much incrassated*, terete and smooth at the base, then suddenly thickened, above slightly flattened with numerous spines, some of them being connected by low transverse ridges. First external spur with two small ones at its base, second of equal length. Pulvilli of tarsi small, those of first joint elongated. Abdomen with eighth dorsal segment of male produced, medially divided at the apex into two broad triangular lobes. Cerci short, terete, hirsute. Subgenital lamina of male short, divided into three lobes, the middle one narrow, thick and long, apex obtuse; lateral lobes in the form of low tubercles. Ovipositor nearly straight, apex bluntly acuminate.

The genus appears to me much more nearly related to the American *Cratomelus* than to the geographically nearer Asiatic members of the tribe. The differences are indicated in the synopsis.

PACHYPODAGRUS CRASSIPES, *spec. nov.*

Size large. Brownish ferruginous, banded with brown. Legs pale, spines and claws tipped with black. Ocelliform spot small, circular, indistinct. Hind femora below with 12 internal and four to six external spinelets. Hind tibiæ very stout, above with six spinelets on each margin, besides the apical spurs. Ovipositor straight, very long. Two males, one female.

	Male.	Female.
Length of body ...	25 –30 mm.	30 mm.
Length of pronotum...	6 "	7·5 "
Length of elytra ...	3·5– 5 "	6 "
Length of hind femora	17 "	18 "
Length of ovipositor	—	47 "

Habitat.—Oladdie, South Australia *(McGregor)*; Silverton, New South Wales *(F. A. Fiveash)*; Northern Territory of South Australia *(Hon. S. J. Magarey, M.B.)*; (Collection of S.A. Museum). The smaller male had been preserved originally in spirit, then dried, the body is therefore in a considerably shrunken condition; the other specimens were simply dried, which may account for the difference in dimensions.

PACHYPODAGRUS MAGAREYI, *spec. nov.*

Size moderate. Greyish-testaceous, concolorous. Clypeus quadrangular, transverse, lower margin distinctly sulcate, about

one-third less in width than the upper. Mandibles blackish, almost embracing the labrum. Fore and middle tibiæ with four external and three internal spines. Hind femora with six spinelets on the inner margin, the outer being unarmed. Hind tibiæ moderately stout, with six spinelets on each margin. Ovipositor short, slightly incurved.

	Female.
Length of body	27 mm.
Length of pronotum	5 "
Length of elytra	2 "
Length of hind femora	14 "
Length of ovipositor	23 "

Habitat.—Northern Territory of South Australia.

The species is dedicated to Dr. S. J. Magarey, M.L.C., who presented it in 1886, with a number of other insects, to the S.A. Museum.

On the Cambrian Rocks at Curramulka.

By G. B. Pritchard.

(Communicated by Professor Tate.)

[Read November 3, 1891.]

This paper is the outcome of a trip to Curramulka for the purpose of obtaining information with regard to the Cambrian rocks which were recently discovered at this locality.

Curramulka is one of the hundreds on the eastern side of Yorke Peninsula, and the township of the same name lies about twelve miles to the north-west of Port Vincent, at about the lowest part of a basin-shaped hollow; and it is in and around this township that the formation in question occurs.

This area is coloured, to indicate that the rocks belong to the metamorphic series of Silurian age, by Mr. H. Y. L. Brown, in his sketch map of geology of South Australia; but recently Mr. A. W. Fletcher, B.Sc. (Proc. Roy. Soc. S.A., vol. XIII., part II., p. 249), proved that they were fossiliferous, and from the material he brought to light they were seen undoubtedly to belong to the Cambrian, thus adding another locality for fossils of this age.

The whole of the country between Port Vincent and Curramulka to within a mile of the latter place is covered by several feet of travertine, the wells and tanks showing this deposit to be from about seven to ten feet in thickness.

Eocene.

Deposits of Eocene age are met with at the coast, where they are exposed in, for the most part, low-lying cliffs along the western shores of St. Vincent's Gulf, from near Black Point to Edithburgh to the south, a distance of about 32 miles, without a break. The rock in the neighbourhood of Port Vincent and Stansbury consists of a yellowish polyzoal limestone containing echinoderms, brachiopods, and a few lamellibranchs, and bears a strong resemblance, not only lithologically, but also in the character of its contents, to the polyzoal limestones at Aldinga; and at Waurn Ponds and the Moorabool Valley, in Victoria. How far the Eocene extends inland I cannot say, as in no place along the route I took was the travertine cover removed to expose the underlying rock. The following is a list of the species which have been obtained from this coast, and it will be readily seen that these beds belong to the same horizon as those just mentioned :—

ECHINODERMATA.

Cidaris (spines and plates).
Echinus Woodsii, *Laube.*
Paradoxechinus novus, *Laube.*
Holaster Australiæ, *Duncan.*
Fibularia gregata, *Tate.*
Scutellina patella, *Tate.*
Monostychia deltoidalis, *Tate, m.s.*
Maretia anomala, *Duncan.*
Eupatagus, two sp.
Lovenia Forbesi, *T.-Woods.*

BRACHIOPODA.

Terebratula (?) bulbosa, *Tate.*
Waldheimia furcata, *Tate.*
Waldheimia sufflata, *Tate.*
Waldheima Vincentiana, *Tate.*
Waldheimia Tatei, *T.-Woods.*
Terebratella Tepperi, *Tate.*
Terebratulina Scoulari, *Tate.*
Terebratulina lenticularis, *Tate.*
Magasella compta, *Sowerby.*
Magasella deformis, *Tate.*
Rhychonella squamosa, *Hutton.*

LAMELLIBRANCHIATA.

Pecten Eyrei, *Tate.*
Spondylus gaderopoides, *McCoy.*

CAMBRIAN.

The rock is a hard crystalline limestone, varying from flesh-colour and grey to blue. I did not obtain any fossils from either the flesh-coloured or grey limestone, the latter seeming more particularly to carry minerals, while the blue yielded the fossils. This variation in lithological character would seem to indicate the existence of three beds, and if such is the case their relations to one another have yet to be worked out.

Area.—The boundary of the outcrop which I actually traversed was as follows:—Eastwards for a distance of about two and a-half miles a road is met running north and south; the outcrop is lost to view on the brow of a slight elevation close to this road; following the boundary southwards it runs parallel to the road for about one and a-quarter miles, then turns to the right, and has a general westerly direction for two and a-half miles, crossing the Port Vincent-road at about a mile south of the township and the next road to the west at the same distance. The outcrop along this portion of the southern boundary is lost

to view on the brow of the hills, which there form a part of the basin. Northwards, about one mile, the outcrop apparently disappears at a short distance from the cross roads, thence along the boundary westwards crossing the Minlaton road, which runs about south-west, at half-mile from the point just mentioned, thence through section 59 N., crossing the Mount Rat and Port Victoria-road at the boundary of sections 59 N. and 81.

So that filling in the remainder approximately I should estimate the area of actual outcrop at about ten square miles. That the limestone does occur at no great depth below the surface in the surrounding country is evidenced by the following facts:—To the east, in section 51 E., there is an opening somewhat below the general level of the surface which leads into a cave in the Cambrian limestone. About one-half mile further, in section 50, near the boundary fence, there is a well about 20 feet deep, which, after passing through the travertine, entered a yellow clay for some feet, and then angular fragments of the blue limestone. Also to the south, in section 34, the property of Mr. Talbot, a quarter-mile from the road, there is a very large cave in the same rock. It is comparatively easy to enter, and when some distance in the passages become very numerous, some of them just allowing a person to crawl along, and then suddenly they open out into large chambers. The walls in some parts have a slight incrustation of stalactitic material, but so far as I went there was nothing striking in this respect; the limestone forming the walls inside is very interesting from its peculiar nodular or concretionary appearance, which has, no doubt, been due to weathering action. The floors in some places have a covering of two feet or more of dust, which is full of bones; among the few obtained were the lower jaws and skulls of rats, lower jaws of an opossum, and numerous limb-bones of various small marsupials. The length of this cave is unknown; but it is said to extend for miles, though no one has yet reached the end of the passages. In section 37, the property of Mr. Bickers, about 100 yards from the road, there is a well, the depth of which is 120 feet. Below the travertine here is a yellowish sand, which was passed through for nearly the whole depth, and at the bottom a hard breccia was reached, which was made up of small angular fragments of the Cambrian limestone, held together by a matrix of brownish sand.

A well in the township gives us a depth of 140 feet. Only 40 feet of this was sunk when in search for water, as the first 100 feet was in a natural cave, and there has always been a constant supply of water in it.

A small outcrop of about half a mile square in extent is said to occur at about four miles south of Curramulka; but as I had not

an opportunity of visiting the locality, I cannot speak definitely about it.

Caves in the same rock are also said to occur in the neighbourhood of Mount Rat, which lies about four miles to the north-west.

The fossil fauna of this locality contains *Conocephalites australis*, *Orthisina*, *sp. nov.*, *Ophileta*, *sp. nov.*, *Salterella*, *n. sp.*, and some other species, which are enumerated by Professor R. Tate in his paper on "The Cambrian Fossils of South Australia."

Minerals occur in the grey rock, but apparently only in small quantities. I obtained small specimens of the green and blue carbonates of copper, copper pyrites, galena, calcite, and fluorite.

Glaciated Rock Surfaces.

To the north of the township there are evidences which seem to be attributable to none other than glacial action, for the exposed surface of the rock is very flat and smooth, and in many places scratched and scored, the general direction of the striæ being north and south, and occasionally deep and smooth grooves are met with. I did not see any rocks of foreign material in this locality but numerous angular and subangular fragments of the hard limestone. At the coast, however, about one mile to the north of Port Vincent, there are several large boulders of a coarse granite, with large felspar crystals, which may have been carried there by glacial agency; but as I am informed that granite occurs *in situ* both to the north and south of this locality, the presence of these boulders may have been due to other causes.

In this connection I would draw attention to an appearance on the weathered surface of this limestone, which simulates very much glacial striæ. Upon breaking a fragment off the rock it is found to be due to a series of small veins of calcite being weathered at a faster rate than the matrix, this being a little below the level of the surface.

In conclusion, it might be interesting to mention that during the recent dry season many farmers have been sinking for water, and in some places a good supply has been obtained at a depth of from 7 to 12 or 14 feet, that is just below the travertine in a deep red loam which overlies the Cambrian limestone in places to a depth of a few feet.

The Cambrian Fossils of South Australia.

By Professor R. Tate, F.G.S., F.L.S.

[Read September 6, 1892.]

Plate II.

The history of the discovery of Cambrian rocks in our Province is briefly and succinctly given by Mr. Etheridge (Trans. Roy. Soc. S. Aust., vol. XIII., p. 10, 1890) in an introduction to his paper descriptive of some corals obtained from this horizon. During the past two years additional palæontological discoveries have been made at Parara and Curramulka, on Yorke-Peninsula; and as a fairly representative fauna of the Lower Cambrian or Olenellus-zone has now been obtained; it is highly desirable that it should be publicly recorded. At least twenty-three determinable species have been elaborated; whilst various obscure fossils, whose zoological relations cannot be interpreted, represent some four or five additional ones.

The fossils are in an excellent condition, their tests being in all cases well preserved; but the absence of a bold outcrop, or face of stone, and the want of bedding planes in the rock reduce fossil-collecting to the level of the labourer who breaks stones for road-metal. The difficulty of obtaining complete specimens, or in relief on the stone, is obviously very great; whilst the intractable nature of the matrix does not permit of developing the fossils. The location of those genera, whose essential characters are internal, is guess-work, because in no instance have interior aspects or casts been obtained.

The following list contains all the definable elements of our Cambrian fauna. The note on the occurrence of *Hyalostelia* is by Mr. W. Howchin, F.G.S.

GASTROPODA.

Stenotheca rugosa, *Hall.* Plate ii., fig. 4.

Ref.—Walcott, American Jour. Sc., 1887, t. 1, fig. 11.

Stenotheca rugosa, var. paupera, Shaler and Foerste, Bull. Mus. Comp. Zool., 1888, p. 29, t. 1, fig. 9.

Stenotheca ? rugosa (Hall), Walcott, Tenth Annual Report U. States Geol. Surv., 1890, p. 617, t. 74, fig. 1.

All of the few examples of this species, obtained at Ardrossan, are referrable to the variety *paupera*.

Ophileta subangulata, *spec nov.* Plate ii., figs. 8*a-b*.

Shell minute, concave above, smooth, composed of two rapidly increasing whorls, which are in contact but not embracing. The periphery of the last whorl is compressedly rounded, the upper surface slightly declining from it to about two-thirds the breadth, thence steeply sloping to the suture ; this sudden change of slope simulates a keel in the anterior one-third of the whorl, producing a slight concave slope between it and the periphery. Base tumidly convex.

Dimensions.—Major and minor diameters, 3· and 1·5 respectively.

Locality. — Cambrian limestone at Parara, near Ardrossan (several examples).

The two species of *Ophileta*, figured by Etheridge, Proc. Roy. Soc., Tasmania, 1863, tab. 2, figs. 13, 14, from the Cambrian or "Caroline Creek beds" of the Mersey River District, Tasmania, are very different from the one here described.

Platyceras primævum, Billings, seen from above, as figured by Shaler and Foerste, Bull. Mus. Comp. Zool., 1888, p. 30, tab. 2, fig. 10, has the general outline of *Ophileta subangulata*, but the last whorl is "throughout evenly rounded," and moreover is devoid of the submedial angulation. Despite the similitude, I do not think the two species are congeneric.

Platyceras Etheridgei, *spec. nov.* Pl. ii., figs. 7*a-7c*.

Shell small, broadly conical ; apex obtuse, posterior, recurved, but not spiral, usually protruding beyond the posterior margin ; aperture roundly oval, but irregular in outline, subtruncated and narrowed posteriorly. Surface ornamented with rather thick subimbricating concentrie folds of growth, and curved beneath the apex coincidently with the posterior margin ; faintly radially wrinkled.

This very common species exhibits considerable variability in the outline of the aperture, and the amount of backward projection of the apex. The shells seem to have lived on irregular surfaces, and in some instances at least upon trilobites.

Dimensions.—The proportionate measures of the basal diameter and height are as 4 to 3 ; the longest diameter observed is 6 mills.

Locality.—Curramulka, in Cambrian limestone.

The species is dedicated to Mr. R. Etheridge, junr., who has contributed so largely to the elaboration of the Cambrian fauna of Australia.

The irregularity of its margin and less-tumid sides distinguish *P. Etheridgei* from *P. Dawsoni*, Walcott.

LAMELLIBRANCHIATA.

Ambonychia macroptera, *spec. nov.* Pl. ii., fig. 10.

Shell very small, obliquely triangular, sub-convex, umbones terminal; ornamented by numerous slender radial ridges about as wide as the alternating furrows; posterior margin medially subangulated.

Wing nearly as large as the valve, much expanded posteriorly, with a prominent fold or border on its ventral margin, separated however from the hinge-line by a deep suture; superior to the marginal fold the surface is broadly depressed, the dorsal margin is straight but ascending. The surface is marked by sigmoidal growth-folds, and the posterior margin is coincidently curvilinear.

Dimensions.—Oblique axis, 3·5; transverse axis, 2·5; width of wing at posterior end, 2·5; its oblique axis, 3 millimetres.

Locality.—Cambriam limestone at Curramulka (three examples).

PALLIOBRANCHIATA.

Orthisina compta, *spec. nov.* Pl. ii., figs. 6-6*a*.

Transversely subquadrilateral, equilateral; hinge nearly straight, not quite so long as the greatest width of the valve.

Dorsal (?) valve flatly convex with depressed anterior- and posterior-ventral areas, which are separated by a submarginal roundly elevated medial fold.

Surface marked by distant, broad undulations; in the umbonal area these have a rhomboid outline, but towards the front are medially incurved, coincident with the curvature of the ventral margin; the folds and intervening furrows are distantly and coincidently linear-striate, and ornamented radially by depressed subangular plications (about 30), which are wider than the interstitial furrows. Hinge area with a subquadrate, subconvex, nearly vertical median projection, flanked on each side by a linear-lanceolate, longitudinally plicate-striate area.

Dimensions.—Length of hinge-line, 7; greatest antero-posterior diameter, 9; greatest umbo-ventral diameter, 6.

Locality.—Cambrian limestone at Curramulka.

Orthis (?) peculiaris, *spec. nov.* Plate ii., fig. 5.

Transversely subquadrilateral, equilateral; hinge-line in the longest antero-posterior diameter, straight.

Ventral (?) valve flatly convex, with an abruptly depressed and deeply bilobed ventral margin; the mesial furrow decreases in depth as it ascends to near the umbo; the lateral margins are obliquely arched, nearly straight, forming an angle of about 70° with the hinge-line.

Surface marked by depressed unequal folds of growth.

This valve is considered ventral, because the broken surface in the umbonal region indicates that there had been a small, slightly-elevated beak.

Dimensions.—Length of hinge-line, 20; umbo-ventral diameter, 11; greatest vertical depth of medial furrow, 7 millimetres.

Locality.—Cambrian limestone at Parara, near Ardrossan (one valve).

PTEROPODA.

Salterella planoconvexa, *spec. nov.* Plate ii., figs. 3-3*b*.

Salterella sp., Tate, Trans. Roy. Soc. S. Aust., 1890, p. 249.

Test rather thick, externally finely and closely wrinkled-striated transversely. Shell broadly conical, tapering to an acute point; plano-convex in a medial transverse section; lateral margins rounded or subangulated. Dorsal surface convex, but towards the apex marked with a shallow medial depression bounded by broad obscure ridges. Ventral surface with a broad shallow medial depression, more conspicuous in the apical region.

A natural longitudinal fracture discloses two invaginated septa, and a transverse section near the apex one invagination.

Dimensions of a moderate-sized example :—Length, 28; dorso-ventral diameter, 7; lateral diameter, 10 mills.; but the pro portionate measures of the diameters are variable. The longest example measures 35 mm. in length.

Locality.—In the Cambrian limestones at Curramulka.

This species has an external resemblance to *Hyolithes Billingsi*, Walcott, which is described as possessing flat transverse septa. *S. Hardmanni*, Etheridge, the only described Australian species of the genus is elongate-conical, with a circular transverse section, and consequently is far removed from *S. plano-convexa*, which seems to stand alone among congeners.

Hyolithes communis, *Billings.* Plate ii., fig. 2.

Ref.—*Hyolithes communis*, Shaler and Foerste, Bull. Mus. Comp. Zool., 1888, t. 2, f. 23, p. 34; *id.*, Walcott, Tenth Annual Report, U. States Geol. Surv., 1890, t. 77, figs. 3 and 4.

Shell straight, gradually tapering, marked by fine transverse striæ and concentric ridges; the transverse sections are circular or slightly oval.

Locality.—Cambrian limestones at Curramulka.

Hyolithes conularioides, *spec. nov.* Plate ii., figs. 1—1*a*.

Shell straight, elongate, tapering to an acute point, apical angle about 20°; lateral angles sharp. The dorsal and ventral surfaces similar (?); each with two elevated subacute ridges separated by a deep concave medial furrow, the slope from the ridges to the lateral margin moderately steep. Posteriorly the

ridges become less prominent and the marginal areas less arched. Surface very finely and closely wrinkled-striate transversely.

Length.—25 mills.

Locality.—Cambrian limestones at Curramulka.

TRILOBITA.

Dolichometopus Tatei, *H. Woodward.*

Geological Magazine, August, 1884, t. xi., fig. 3, p. 343.

Conocephalites australis, *H. Woodward.*

Op. cit., t. xi., figs. 2*a*., 2*b*.

Olenellus (?) **Pritchardi,** *spec. nov.* Plate ii., fig. 11.

Head broad, semicircular in outline, about 15 mm. broad, and 8 mm. long, slightly convex ; margin rather broad and continuous all round, separated about midway from the glabella and cheeks by a narrow low ridge ; glabella oblong, slightly convex, ill-defined by a groove ; eye-lobes crescentiform, narrow, elongate, arching from the base and becoming confluent with the glabella near its summit ; the area between the glabella and eye-lobe is slightly depressed, broad and subdeltoid.

The absence of glabella-furrows and the uncertainty of the presence of genal spines render doubtful the generic location of this trilobite, which is named after Mr. G. B. Pritchard, whose zeal as a collector has so largely enriched our knowledge of the Cambrian fauna of this province.

Microdiscus subsagittatus, *spec. nov.* Plate ii., fig. 12.

Head obtusely sagittate-triangular, about 7 mm. broad and long ; the glabella is oblong, strongly convex, obtusely-rounded, but not narrowed in front, one slight furrow crosses its posterior-third, posterior to which it is narrowed.

Cheeks slightly overhanging the outer marginal groove.

The shape of the head serves to distinguish this species from all others to figures of which I have had access.

Gen. ? Spec. ? Plate ii., figs. 9 and 13.

I figure two very distinct free-cheeks, each having a genal spine, which cannot be referred to any associated species of which the heads are known. Up to the present no glabella without the cheek-pieces have as yet been found.

It is also noteworthy that the remains of trilobites consist solely of heads, of which a considerable number has been collected, neither body-rings nor tail-pieces having yet been discovered.

ENTOMOSTRACA.

Leperditia, *spp.*

The presence of this genus is indicated by the occurrence of two species, one, which has much resemblance to *L. dermatoides,*

Walcott, is oval in outline, and about 3 mm. in the long diameter; the other has a circular outline, with a diameter of about 1 mm. Both are moderately common, but I have not secured any example of either sufficiently free from matrix to permit of a critical comparison with figured species, or to figure with a sufficient degree of accuracy.

ZOANTHARIA.

Protopharetra (?) Scoulari, *Etheridge, fils.*

Trans. Roy. Soc. S. Aust., vol. XIII., p. 18, t. 2, figs. 5-7, 1890.

Ethmophyllum Hindei, *Etheridge, fils.*

Op. cit., p. 14, t. 2, figs. 1-4; t. 3, figs. 9, 10.

Coscinocyathus Tatei, *Etheridge, fils.*

Op. cit., p. 17, t. 3, figs. 3-5 (non figs. 1, 2, and 6-8).

Coscinocyathus (?) Etheridgei, *spec. nov.*

C. Tatei (pars), Etheridge, fils, op. cit., t. 3, figs. 1-2, 6-8 (non figs. 3-5).

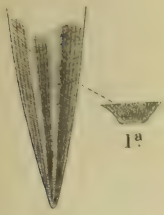
The coral to which I would restrict the name of *C. Tatei*, which comes from the Ardrossan limestone, is cup-shaped, very rapidly enlarging, with the basal part consisting of vesicular tissue. From that species I separate the specimens from the Flinders Range, in which the septal structure is meandriform amongst vesicular tissue. The habit of the two corals is so very different as to suggest generic distinction, though it would seem that the anatomical characters are identical.

SPONGIDA.

Girvanella, sp., *Etheridge, fils.* Op. cit., p. 19, tab. ii, fig. 8.

Hyalostelia, *sp.*

Zittel's *Hyalostelia* comprises a genus of palæozoic sponges with siliceous spicules and of hexactinellid type. Their remains are not uncommon in the Carboniferous limestone of Scotland, Ireland and the North of England. The long spicular rods attracted attention as early as 1844, when McCoy referred them to the Annelida, figuring them in his "Carboniferous Fossils of Ireland" under the name *Serpula parallela*. On the discovery in the Scotch beds of six-rayed spicules in association with the rods, its affinity with the sponges was at once apparent, and led to its being classed with *Hyalonema*, or "glass-rope sponge" of the present seas. A better aquaintance with the fossil-forms revealed differences of structure from the existing genus that has led Zittel to still further amend the classification by separating the palæozoic forms from the recent under the generic name of *Hyalostelia*.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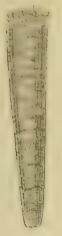
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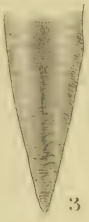
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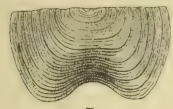
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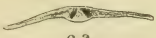
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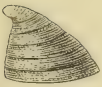
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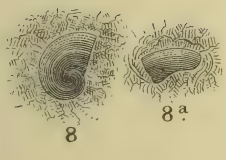
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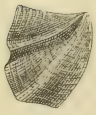
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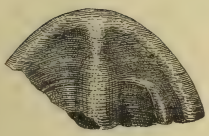
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H.B. lith.

Hussey & Gillingham. Lith.

Examples of this sponge have been found in the rocks of the Northern Hemisphere as low down as the Ordovician, but so far as I know they have not hitherto been detected in beds of Cambrian age. It was therefore with some interest that I discovered their presence in two transparent sections made of the Curramulka limestone. *Hyalostelia* has regular six-rayed spicules, often with one ray much longer than the rest, and these are interlaced with elongated spicular rods. All these features are apparent in the Curramulka specimens. In the stone the spicules and rods are not in their natural position, but are scattered irregularly in the matrix. The long-rayed arm was clearly seen in one of the spicules, but as its position was not coincident with the plane of the section, it was ground away before the required thinness was obtained. The same thing occurred with the rod-shaped spicules which have been cut at various angles in the transparent sections. The remains of this sponge obtained so far are very limited, and not under the most favourable conditions; it would therefore be premature to attempt a specific determination of the Curramulka specimens, but their very small size renders it probable that they are specifically distinct from the examples of *Hyalostelia* already known.

EXPLANATIONS TO PLATE II.

Fig.

1-1*a*. Hyolithes conularioides. Lateral view and demi-sectional outline. Enlarged 2x.
2. Hyolithes communis. Nat. size.
3-3*b*. Salterella planoconvexa. Dorsal and ventral aspects, and sectional outline. Nat. size.
4. Stenotheca rugosa. Lateral view. Enlarged 3x.
5. Orthis peculiaris. Nat. size.
6-6*a*. Orthisina compta. Dorsal (?) valve and cardinal area of the same. Enlarged 2x.
7*a*-7*c*. Platyceras Etheridgei. Three views, enlarged 2·5x.
8*a*-8*b*. Ophileta subangulata. Upper surface and lateral aspect, enlarged about 3x.
9. Free cheek of unknown trilobite. Enlarged 1·5x.
10. Ambonychia macroptera; much enlarged.
11. Olenellus (?) Pritchardi. Enlarged 2x.
12. Microdiscus subsagittatus. Enlarged 3x.
13. Another free cheek. Enlarged 2x.

Critical Remarks on A. Bittner's "Echiniden des Tertiars von Australien."

By Professor Ralph Tate, F.G.S.

[Read October 4, 1892.]

A reference to the above-mentioned paper, published in the Transactions of the "Kaiser-Kong. Akad. der Wissenschaften in Wien," and read before that Society March 10, 1892, is here made partly as a supplement to my communication on the Echinoids of the Australian Eocene in Trans. Roy. Soc. S. Aust., vol. XIV., p. 270, 1891, but more particularly as an illustration of the evil of intrusting diagnostic work (except under very special circumstances) to external authors, who cannot have that thorough knowledge of the mode of occurrence and habits of the objects which is so essential to exactitude in defining the limits of variability of species.

Last year I despatched to Dr. Stur, as Director of the Imperial Museum of Vienna, a large suite of fossils from the Older Tertiary strata of Australia, amongst which were sixteen species of echinoids, fairly well represented individually; this material served as the basis of Mr. Bittner's paper. I exercised the greatest care in the selection of the specimens, being desirous to forward only those of established species; in the case of *Psammechinus Woodsi*, *Paradoxechinus novus*, and *Fibularia gregata* the series was fairly large, so as to embrace, in my opinion, considerable range of individual variation. Of the small number of species sent to the Vienna Museum Mr. Bittner makes five additional species, some new varieties, and establishes three new genera. His communication has, however, despite the forcible effort at species-making, a value by illustrating the extent of individual variation of certain common species, and by defining minute details of structure which may indicate some generic relationships not hitherto recognised; it is, moreover, accompanied by four well-executed plates.

The same author supplies a bibliographic reference which was unknown to me, viz:—*G. Cotteau*, "Mem. Soc. Zool. de France, 1890," wherein are described some new or little-known echinoids, including some species from our Eocene strata. That paper is not yet accessible to me.

The following additional references are noteworthy.

Salenia tertiaria, *Tate*.

Pleurosalenia tertiaria, Pomel, Classification method, p. 94, 1883.

Salenia tertiaria, Bittner, op. cit., t. 1, figs. 6 to 7, p. 333.

Psammechinus Woodsi, *Laube*.

Id., Bittner, op. cit., t. 1, fig. 1, p. 334 ; and *var. fasciger*, t. 1, fig. 2, p. 336.

Psammechinus humilior, Bittner, op. cit., t. 1, fig. 3, p. 337.

Laube's species is very variable in shape and in the density of the granular ornamentation, particularly on the interambulacral plates. Bittner's *P. humilior* is a large depressed form, and the most commonly occurring. *P. Woodsi*, var. *fasciger*, Bittner, differs by the slight tumidulosity of the interambulacral areas, but this character is also associated with depressed tests, like those of *P. humilior*, as well as with the conic shapes such as Bittner figures. All these occur in the River Murray Cliffs. The species is represented in the Aldinga Cliffs also by the *humilior*-form which graduates into an extreme state, in which the secondary granulation is almost obliterated. It would be quite possible to select half-a-dozen specimens to which as many distinctive names could be applied.

Paradoxechinus novus, *Laube*.

Coptechinus lineatus, Bittner, op. cit., t. 1, fig. 4, p. 338.

Orthologhus lineatus, Duncan.

Coptechinus pulchellus, Bittner, op. cit., t. 1, fig. 5, p. 342.

Paradoxechinus novus, Bittner, op. cit., t. 4, fig. 4, p. 344.

I have always been dubious as to the distinctiveness of *Orthologhus lineatus*, Duncan, from *Paradoxechinus novus*, Laube ; but I had reserved an expression of opinion till I had an opportunity of examining an example of Duncan's species collected at the locality of his type. Bittner's interpretation of the characters of *Orthologhus lineatus* leaves, however, no doubt, I think, as to the identity of the two. It is noteworthy that Duncan regards *Coptechinus* as a synonym with *Paradoxechinus*, whilst Bittner makes Duncan's genus *Orthologhus* synonymic with *Coptechinus*, but places *Paradoxechinus* independently. Duncan in his classificatory arrangement of the echinoidal genera removes *Paradoxechinus* far from *Psammechinus ;* but my own observations on our Eocene species of the two genera induce me to bring them into very close relationship.

As the result of an examination of many scores of specimens, collected at the same locality and horizon, of what I recognise as *P. novus*, including those obtained from the same place as Laube's type, I find that the test varies from low-depressed to

moderately sub-conical, that the ornamentation of the plates exhibits very great diversity, ranging from a few radial lines of granulations of varying prominence to densely-packed granulations without any conspicuous radial arrangement; Bittner's *Coptechinus pulchellus* is a form between these extremes.

MONOSTYCHIA AUSTRALIS, *Laube.*

Id., Bittner, op. cit., t. 2, figs. 5-8, p. 345.

MONOSTYCHIA ETHERIDGEI, *Johnston.*

Micraster Etheridgei, Johnston, Proc. Roy. Soc. Tasm., 1877, p. 116.

Monostychia Etheridgei, Johnston, Geology of Tasmania.

During a recent visit to Table Cape I collected a single example of a small *Monostychia*, which is without doubt Johnston's species. The original generic reference by Johnston must have been a *lapsus calami*, as the diagnosis of the species imperfectly indicates a *Monostychia*-like fossil, and the subsequent reference as given above may be regarded as a corrected erratum. *M. Etheridgei* differs from *M. australis* by its narrow oblong-oval outline and its low regularly-convex dorsal surface, broadest behind, with blunt incisions, and gradually narrowing to the somewhat-produced shortly-rounded anterior margin; the tumid ambital margin is very distinctive. Length 18·5, greatest breadth 14·5, thickness 3·75 mm. Specimens from the Murravian beds attain to twice these dimensions.

FIBULARIA GREGATA, *Tate.*

Id., Bittner, op. cit., t. 2, fig. 2, p. 347; *var. orbiculus*, t. 2, fig. 1.

Fibularia Tatei, Bittner, op. cit., t. 2, fig. 3, p. 348.

Mr. Bittner's new species represents an individual state of a profusely-abundant and protean form.

CASSIDULUS LONGIANUS, *Gregory.*

Australanthus longianus, Bittner, op. cit., t. 3, fig. 2, p. 350.

Gregory's species is made the type of a new genus. I am not prepared to discuss the advisability of this step.

CATOPYGUS ELEGANS, *Laube.*

Tristomanthus elegans, Bittner, op. cit., t. 4, fig. 3, p. 352.

Bittner established a new genus for the reception of our fossil, *Nucleolites subcarinatus*, Goldf., and *Echinanthus subhemisphaericus*, Ebert. The Australian species had already been separated from *Catopygus* under the subgeneric title of *Studeria*, and there is no valid reason for its rejection and the substitution of *Tristomanthus*.

PYGORHYNCHUS VASSALI, *Wright.*

Pliolampas Vassali, Pomel, Classification method.

ECHINOLAMPAS POSTEROCRASSUS, *Gregory.*

Progonolampas Novæ-Hollandiæ, Bittner, op. cit., t. 3, fig. 1, p. 357.

The specimens forwarded to Vienna are authentic examples of Gregory's species, which Mr. Bittner seems to find sufficient individual characters in them to make a new species. Whether or not there is good foundation for the creation of a new genus, I have no desire at present to discuss, but I must strongly protest against such reckless species-making.

ECHINOLAMPAS GAMBIERIENSIS, *Ten.-Woods.*

? Echinolampas Morgani, Cotteau.

I question very much if there be more than one species of this genus in the River Murray Cliffs, but being unacquainted with Cotteau's diagnosis of his new species, I can only cast a doubt on its validity. My knowledge of *E. Gambieriensis* is very extensive, as the species is common, though the possible occurrence of a second species must be admitted.

HOLASTER AUSTRALIÆ, *Duncan.*

? Galeraster Australiæ, Cotteau.

H. Australiæ, Bittner, op. cit., t. 3, fig. 3, p. 359.

H. difficilis, Duncan, regarded by me as a crushed *H. Australiæ*, is erected by Pomel into a new genus with the name *Corystus.*

CARDIASTER TERTIARIUS, *Gregory.*

Id., Bittner, op. cit., p. 360.

MICRASTER ARCHERI, *Ten.-Woods.*

Cyclaster lycoperdon, Bittner, op. cit., t. 4, figs. 1, 2, p. 360.

? Cyclaster Morgani, Cotteau.

Of this familiar echinoid of the River Murray Cliffs two examples were sent to Vienna under the name of *Brissopsis Archeri*, Woods; and because Mr. Bittner had no knowledge that the species had been diagnosed he substitutes a new designation.*

Bittner admits that *Micraster brevistella*, Laube, is congeneric with his new species, but I have already shown that Woods' name has priority; as to Cotteau's *Cyclaster Morgani*, there is good reason to believe that it belongs to the same species.

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* Unter dem Namen *Brissopsis Archeri*, Woods, welcher meines Wissens nicht publicirt worden ist *(sic)*.

Had I been influenced by my own judgment, and not by Duncan's, I should have continued to retain *Hemiaster Archeri*, Ten.-Woods, in *Brissopsis*, to which Duncan refers *Cyclaster* as a synonym. However, the characteristic, incomplete, simple, peripetalous fasciole has already been described by me, and subsequently figured by Bittner; the association therewith of an almost obsolete anterior groove may make it desirable to employ the name of *Cyclaster* for our species in place of *Micraster* or *Brissopsis* as hitherto.

Lovenia Forbesii, *Ten.-Woods.*

Sarsella Forbesii, Pomel, Classification, p. 28; *id.*, Bittner, op. cit., p. 364.

Eupatagus rotundus, *Duncan.*

Euspatangus rotundus, Bittner, op. cit., p. 365.

Eupatagus Murrayensis, *Laube.*

Euspatangus Murrayensis, Bittner, op. cit., p. 365.

Hemiaster planedeclivis, *Gregory.*

Id., Bittner, op. cit., t. 2, fig. 4, p. 366.

Gualteria Australiæ, *Cotteau.*

This is an interesting addition to the echinoid-fauna of the Australian Eocene, and is unrepresented in my collection.

The Effects of Settlement and Pastoral Occupation in Australia upon the Indigenous Vegetation.

By Samuel Dixon.

[Read October 4, 1892.]

I propose to consider in this paper the general effect of settlement in Australia upon the native vegetation, not only by the direct results of cultivation in destroying it, but also those produced indirectly by the introduction of foreign plants; and finally the effect of grazing upon the indigenous fodder-plants.

To generalise on these subjects over such an extensive area as Australia may seem to be presumptuous in view of its widely-different soils and climatic conditions, and though I am fully aware that no one can be in a position to compare all the typical districts, yet I venture to record the results of my own observations in both the settled and unsettled districts of extra-tropical Australia, having paid particular attention as a practical grazier during the last thirty years to the native growths.

Settlement in Australia has been largely influenced by legislature. The pioneer has usually been the cattle-breeder who, following the surface-waters, has penetrated under enormous difficulties to the distant interior; next came the wool-grower, who stocked the back country *(i.e.*, back from the rivers), sunk wells and tanks, and enclosed large tracts with wire-fences; in the districts with regular rainfalls the cultivators of the soil succeeded, who now usually combines grazing on a small scale.

In New South Wales and Victoria the principle of "Free Selection before Survey" allowed the farmer to select the richest and most fertile spots, which became centres for the dissemination of foreign plants commonly of little value, in fact, weeds, the rankness of growth of which frequently overcame the indigenous vegetation, especially the herbaceous. On the exhaustion of the soil by cultivation and grazing with cattle in succession, the ubiquitous red gums *(Eucalyptus rostrata)* re-occupied the land, and was accompanied in a small degree by various species of Acacias *(e.g., A. decurrens, A. pycnantha*, &c.), and under their protecting shade there reappeared the perennial grasses, such as species of *Stipa, Danthonia, Panicum*, &c. In other districts the worn-out farms, being grazed with sheep, are now grassy pasture lands and with the exception of the native grasses comparatively few species of the indigenous flora remain.

In North-Western Victoria and South Australia, where very extensive tracts have been cultivated in the "mallee scrubs," it might have been expected that the original mallee (*Eucalyptus oleosa* and *E. gracilis*) would have reappeared, but so far this is not the case, as wherever that mode of cultivation known as "mullenizing" has been sufficiently prolonged to ensure the death of the primitive growth by uprooting the underground stem—popularly known as the "mallee root"—regeneration is almost wholly unknown, and if thoroughly stocked with sheep, it never does take place, owing to the infrequent germination of the seeds and the extreme slowness of growth of the seedlings.

Sufficient time has not yet elapsed since settlement took place to formulate the conditions under which the original vegetation can be expected to reclothe the surface exhausted by farming, but in the cooler and moister regions we find, as stated above, that *Eucalyptus rostrata* does rapidly resume its sway over the cultivated tracts where it originally prevailed; but in the warmer and drier zones we are without any extensive examples of the native vegetation reasserting its dominion. These former areas present the best examples of the overwhelming growth of introduced weeds—the stinkwort *(Inula graveolens)* in summer, and the Cape weed *(Cryptostemma calendulacea)* and sundry thistles, &c., in spring. In the tropical region, however, where abandoned sugar-cane fields are now covered with *Lantana*, we may expect the original dense growth to reappear by degrees.

Necessarily as cultivation proceeds a larger area becomes despoiled of all the native plants. the forests are cleared, and repeated ploughings complete the extermination. Here, introduced plants find a suitable habitat for propagation, and each isolated farm becomes a centre of dissemination of the various weeds, which injuriously affect the grain-crops in the northern hemisphere; a list of these troublesome plants would be very extensive, and it is steadily increasing, and although some few annuals of indigenous growth reproduce in these cultivated spots, yet none of them do so to any injurious extent, none can therefore be considered "weeds."

It would be very difficult to indicate any Australian plant which has increased in numbers while the land is regularly cultivated for a lengthened period; intermittent cultivation does, however, tend to the individual-increase of certain vigorous species, thus on limestone soils we find *Zygophyllum*, *Erodium*, *Erysimum*, &c., similarly where cultivation has been attempted in, or at the boundary of, the saltbush-country, which has prepared the soil for the retention of the seeds, and if stock be kept off for two or three years, the more tenacious plants, such as *Kochia*, *Atriplex*, &c., reappear.

In the moister regions, cultivation generally annihilates everything indigenous, and after its cessation annuals very slowly reappear. Each locality has of course its peculiar species, but the common Purslane *(Portulaca oleracea)*, so widely spread through Asia and Australia, and known by the aborigines as "Parakylia," is almost universal in rich soils.

Many garden plants are spreading rapidly, and becoming weeds, so that it is now quite common to find some of them in secluded localities to which they have spread from a selector's garden; the showy *Vinca rosea*, so abundant on the Queensland coast is a good example, but I do not know of any introduced forest-tree which has reproduced itself largely, except under cultivation, although *Pinus halepensis* might have been expected to do so.

It is safe to conclude that on the whole cultivation means absolute destruction to the Australian flora, whether of the tropical, subtropical, or temperate climates; and because the richest soils are naturally those most suitable for cultivation, the species endemic in those localities are most likely to become extinct. The Illawarra district of New South Wales affords a striking example of the alteration which may take place within a very limited period; in few spots can the botanist now discover the specimens of the peculiar and lovely flora for which it was celebrated, when first settled, and this almost the loveliest district of Australia has now become commonplace and comparatively uninteresting to the botanist.

The farmer, the squatter, the miner, and the swagman all cause extensive conflagrations, and by their oft-recurrence the arborescent growths are reduced to mere scrubs, and the more tender plants, such as orchids and other flowering plants, are utterly destroyed with a recklessness which can only be fittingly described as insane. In aboriginal times fires were much less frequent, and in the forest regions were rarely intentional. Although in the plains-country, between the coastal forest-belts and the desiccated interior, fires were systematically employed in hunting wallabies and kangaroos, yet as these plains were usually grassy little harm resulted; in fact, these fires at long intervals assisted the germination of the hard seeds of the Acacias, &c., and were so far beneficial. Now, however, frequent fires and the subsequent grazing by sheep, which eat off the tender shoots of almost every shrub and the hearts out of the Xanthorreas, and nibble the shoots of other arenaceous-loving plants, prevent anything but the hardiest surviving; from this cause alone many rare plants, most of which are of sporadic occurrence, and would seem to be survivals of a still more ancient flora, are being surely destroyed, although under

other circumstances none of our floras are so likely to remain in their primitive condition as those where the siliceous nature of the soil naturally produces plants which from their innutritious quality fail to support any sort of stock, nor do introduced plants as a rule find this class of soil congenial. It is to be expected therefore that the Banksias, Hakeas, Melaleucas, and other plants eminently characteristic of Australia and peculiar to its sandy poor soils will remain comparatively unaffected in those parts of the continent which are not adapted to carry stock, are unsuited for cultivation, and remain comparatively free from bush-fires.

On these grounds the unique and singularly lovely flora of Western Australia, especially of its "sand plains," and the moist district immediately contiguous to King George Sound, may possibly remain for centuries to come. Indeed to this peculiar flora occasional fires are to some extent beneficial, as not only are the long buried seeds germinated, but many species produce in the succeeding year their most luxuriant blooms. Of this, the locally named Cabbage- or Flame-tree, *Nuytsia floribunda*, is the most conspicuous instance, whose strikingly-brilliant orange-coloured bunches of bloom are only to be seen in their full gorgeousness at this time.

The Xanthorreas too invariably flower after a thorough scorching and thereby afford to bushmen sound data for reckoning the period which elapsed since the last fire.

Indeed, of West Australia it may be said that no other part of the continent is so likely to have some of its indigenous flora preserved intact; because not only from the poorness of the soil and the fire-resisting quality of so many of its endemic plants, but also from the presence of several poisonous and deleterious plants which will not allow of overstocking, which is proving so prejudicial to the Eastern-Australian floras. With the exceptions referred to of West Australia and other analogous soils with corresponding floras, the constant recurrence of extensive conflagrations are in the highest degree prejudicial, and particularly to the forest-regions, and must ultimately destroy the noble growths of those giant forms which add so much to the value and beauty of our forests. In ordinary seasons sufficient moisture exists to prevent extensive destruction, but at intervals extremely dry seasons are experienced, and the undergrowths become highly inflammable; and then miles of country are completely devastated; and although only old or partially-decayed trees are consumed, the scorching of the upper branches of vigorous trees causes these to die away, and, ultimately rotting, the whole trunk becomes involved in decay, so that the next fire makes a prey of every tree so affected; the inevitable result being that wherever fires con-

stantly recur, trees valuable for timber cannot be produced, and finally the forest-regions are reduced to mere expanses of unsightly and useless scrubby growths.

The unwise system of permitting "free selection" within the boundaries of natural forests has produced such enormous destruction of timber that it becomes impossible to even roughly estimate the amount of loss from this cause alone, not only from the fires which the selectors have originated wilfully or carelessly, but from the injury done by stripping the very best timber-trees for the sake of the sheet of bark so obtained, and, in spite of the regulations intended to stop this senseless havoc, the practice is still common to ruin a tree worth possibly four or five pounds sterling for the sake of a sheet of bark worth possibly sixpence or a shilling.

The outlook for succeeding generations is indeed dismal should the destruction of the forests continue as in the past; our watersheds will become bare, bald hills and mountains, from which torrential floods will devastate the alluvial plains, and though the grazing area will be much extended, it will be at the expense of those forest-regions which so greatly affect and modify the extremes of climate for which Australia is remarkable.

We can look to other countries to learn the extent of injury which the destruction of the indigenous flora may entail. Of this Spain affords a good example. Since the Roman period her extensive forests of oak, chesnut, and pine have almost entirely disappeared, and the extremes of climate being thus intensified, that country has lost much of her fertility, and consequently is less able to support a large population.

To counteract the disastrous result of the wholesale destruction of that portion of the Australian flora which now clothes the forest-regions with the very best and most valuable hard woods, an enlightened public sentiment needs to be cultivated, and though a beginning has been made, much remains to be done; and it cannot be too much insisted on that the preservation of the Eucalyptus in its numerous species is of the very greatest and most vital importance to the best interests of Australia. It is of truly national consequence, for not one single instance of an exotic timber-producing tree can be quoted which so completely fulfils the conditions demanded by the soil and climate of Australia as the various Eucalypts now do, namely, great resistance to extremes of heat and cold, rapid reproduction, and a wonderful power of recovery from the effects of fire.

That the public sentiment in favour of the preservation of the indigenous flora is awakening is evidenced by the readiness of large and small land-owners to plant round their homesteads various shelter-trees, which some of the Colonial Governments encourage by the gratuitous distribution of young seedlings.

Ring-barking, especially in New South Wales, where it has been often carried out very injudiciously, has produced deplorable results. Owing to the policy of "selection before survey," it is not infrequent to see magnificent timber ring-barked so as to comply with the "improvement" clause, so that it is possible to see trees worth £5 to £10 a-piece which have thus been ring-barked—destroyed under the pretence to "improve" the "selection." Even on pastoral properties the practice of ring-barking has not been an unmixed benefit, for although the crop of grass is often increased, the more tender herbaceous and shrubby plants die out, partly from the loss of shade, which permits the full effect of frost to be felt, and further injury results from the earlier drying-up of the grasses thus exposed to the full heat of the sun.

In the South-Eastern portion of South Australia a similar result to that caused by ring-barking has been produced by depasturing stock. Large tracts of dead gum-trees are there to be seen, and it appears to me as if the trampling down of the soil by cattle has so altered the conditions of growth, that the trees, losing their vigour, have fallen a prey to insect-pests, which, yearly increasing, have finally killed them.

The only instance in which settlement in Australia has had the effect of increasing the indigenous vegetation on a large scale occurs in the Cobar district, where the Cypress-pine *(Callitris verrucosa)* has increased to such an extent that much less stock can now be carried there. This has arisen apparently from the grass being eaten off by stock, so that bush-fires no longer travel over large areas, and the young plants, which are easily destroyed by fire, growing closely together and seeding abundantly, take complete possession of the soil, to the exclusion of other plants. This is the only instance within my knowledge of any native plant largely extending its area after settlement has taken place.

On the borders and beyond the limits of successful cultivation alien plants do not flourish every season, but some individuals produce seed which, on the occurrence of a wetter season than usual, grow and reproduce with great rapidity wherever the surface of the ground has been broken. This may be observed along our Great Northern railway within the dry interior, where the common weeds of the farming districts have sprung-up and propagated, though it is not yet apparent if these strangers will maintain themselves in so arid a climate, or successfully compete with the indigenous flora—most probably not !

In the regions where cultivation is profitable, the introduced plants prove formidable rivals to the native ones in the struggle for existence, and attain a luxuriance of growth quite unknown in their original habitats ; nor do they confine themselves to cul-

tivated areas alone, since carried about in the hair of horses, in the wool of sheep, or exuded in the dung of cattle, many of them are now to be found in exclusive possession of the best soils. With some, as the thistles, the invasion is transitory, as after exhaustion of the soils of the special constituent required by them, the growth becomes weaker, and the plants finally disappear.

The extension of railways throughout Australia has also greatly assisted in a wide and rapid distribution of imported plants, not only from the seeds present in the hay on which the horses used in the construction of the various lines, but also in the facilities offered for the transportation of fodder grown in coastal regions, into the most distant pastoral districts, and as the soil throughout the interior regions of Australia is commonly of very excellent quality, climatic conditions seem the only bar to their indefinite increase.

It is, however, in the regions of cultivated lands and their immediate vicinity that the most striking examples of the effects of these introductions are to be noted. Two or three plants in particular may be instanced which under certain conditions take complete possession of the soil, to the utter exclusion of any other; the most universally spread and the best known is the corkscrew- or clover-burr (*Medicago denticulata*). Coming up annually with the first fall of rain, it spreads in dense, close masses with prostrate stems, and entirely chokes the growth of any other annual; when the heat of summer is felt it quickly dries up and its abundant seed-vessels then freely cover the ground. No introduced plant has produced greater loss to the woolgrowers than this, for although a fairly good fodder, the seed-pods, coiled up into two or three whorls, readily become affixed by their serrated edges to the wool on the bellies and legs of sheep. To the flock-master the presence of these troublesome seeds means a loss of one penny per lb. on all those parts of the fleece which contain them, so that the total yearly loss amounts to hundreds of thousands of pounds. The best soils with the best climate producing it in the greatest abundance; so that our native clovers, especially the delightfully-scented and invaluable *Trigonella suavissima*, have no chance to survive against so vigorous an enemy.

Another plant, the Bathurst Burr, *Xanthium spinosum*, a South American introduction, is also yearly the cause of great loss to the wool-grower, and though it is only a summer-growing plant, and ripening its troublesome burrs in autumn, yet is useless as a stock food, and to some extent also interferes in certain situations with the reproduction of native plants.

A third example is the South African *Cryptostemma calen-*

dulacea, or Cape-weed, which, like the clover-burr, fairly smothers-out of existence native annuals and perennial grasses; its abundantly produced seeds germinate with the first fall of rain, and the plant grows very rapidly and vigourously. An individual of this procumbent species will often cover a space of 30 inches in diameter, but commonly such exuberant growth is on ground where the surface has been broken by cultivation or otherwise.

Other examples of introduced plants, which take complete possession of the soil, often covering acres, especially where it is very rich, are afforded by various species of the thistle-tribe, and several other European composites have also become very common. Amongst the numerous shrubby plants which threaten to displace the Australian indigenes, none are more noteworthy than the sweet-briar *(Rosa rubiginosa)*, and the dog-rose *(R. canina)*, which on neglected properties take complete possession, and are difficult to eradicate. In the coldest and moistest parts of Australia the Bramble *(Rubus fruticosus)* is already forming tangled brakes as impenetrable as the masses of furze or whin *(Ulex europæus)* to be found under the same conditions. A full list of introduced plants would include a large proportion of small or of no economic value.

The destructive effects of settlement upon the indigenous flora of Australia is nowhere more apparent than in the purely pastoral districts where the rainfall is decidedly scanty. Throughout the immense region known as Riverina, and to the extreme western and northern runs of South Australia, the injury to the original vegetation by overstocking has assumed so great a magnitude as to entail a national loss. Continuous overstocking has destroyed the bushy vegetation and the perennial grasses. The numerous species of *Atriplex*, *Kochia*, *Rhagodia*, and other Salsolaceous plants, *Mesembrianthemum*, and a long list of other small shrubs, together with the smaller tree-growths of various Acacias, *Myoporum*, &c., which formerly provided abundant sustenance for sheep and cattle during ordinary droughts, have now disappeared, and only inedible shrubs, mostly of the Proteaceus order, remain. The effects of this destruction had begun to be felt at each period of drought more and more, and now the rabbit-plague comes to finish the devastation begun by injudicious stocking, so that throughout the territories above mentioned hundreds of square miles are to be found which (except during favourable seasons when the rainfall is sufficient for the growth of annual grasses and herbs) have ceased to carry stock. Indeed, for miles back from the river frontages, and in the neighbourhood of wells and dams, an unproductive surface, trodden down until almost impervious to water, now extends. Hence, from the diminished

yields of wool and the tremendous losses of stock, which each drought now entails, extensive squatting properties fall into the hands of financial institutions, who find that "runs" which formerly produced thousands of pounds per annum now require an income to be spent upon them, as it is only in very wet seasons that a surplus over the expenditure may be expected.

On the Lower Murray River, in the mallee country, many such dire experience could be related, and it does not appear probable that these extensive tracts can become again covered with their original flora so rich and varied in drought-resisting plants, a flora which is unequalled in the world for the abundance and variety of the very best fodder-plants. If it were possible to exclude herbivorous animals from these desolated areas we might hope that in the course of years, the seeds now buried might vegetate and gradually re-clothe the country; but unfortunately, though every few months of drought destroys millions of rabbits, there always remain enough to re-stock the country, and so rapidly do they reproduce that very few months are sufficient to cover the country in incredible numbers. It may possibly happen that in the course of years, as the shrubs from which they derive moisture during the hot months become gradually extinct, they may perchance become extinct also; but it is appalling to think of what must first happen when we find such trees as Sandalwood *(Myoporum platycarpum)*, Mulga *(Acacia aneura)*, Myal *(A. cyclops*, &c.), Leopard-wood *(Flindersia maculata)*, Dog-wood *(Eremophila longifolia)*, and many others, all carefully ring-barked by these destructive rodents.

Only the two extremes of country are safe from these pests, namely, the very moist, where they become attacked by entozoa; and the very dry, say, inside the five-inch rainfall belt, where the rainfall in some years is only two inches, or less.

It is no exaggeration to say that the devastations to the Australian flora by this rabbit-plague are more than all the other causes put together, and the pecuniary loss to Australia has already amounted to many millions of pounds sterling.

In Western Australia the destructive effects of settlement are not so conspicuous; two factors of much importance preventing systematic overstocking exist, and the rabbit-plague has not yet reached there. From the siliceous nature of much of South-Western Australia, there are very large tracts, the prevailing flora of which is so extremely innutritious that neither cattle nor sheep can be profitably kept; and though after fires in the summer the winter rains produce an abundance of tender shoots, stock can only be grazed for short periods. These "sand-plains" are, of course, altogether unfit for the cultivation of any food-producing plants, whilst in other districts the prevalence of plants

poisonous to all ruminants prevents any attempt at systematic overstocking

Originally the gorge of the Lower Murray was well-covered with herbaceous plants and grasses, which were confined to the actual banks of the river and to the lagoons, some of which are two to three miles long, and one to half a mile across. Here the "lignum" *(Muehlenbeckia Cunninghami)*, attained its largest growth, 15 to 20 feet high, and so thickly matted together as to be impenetrable; but at the present time, many miles of this valley have been denuded of lignum, reeds, bulrushes, and grasses, and the prevailing aspect is an uninteresting expanse of dry mud and sand, only diversified by a few Eucalypts. The destruction of the swamp-vegetation throughout Riverina has considerably lessened the amount of stock which formerly grazed upon it during the long hot summers and during droughts.

No class of country suffers so extremely from excessive stocking as the sand-hill country, and especially the sand-dunes which fringe much of the coast-line of Southern Australia. As natural growth is exterminated, the sand, no longer protected by the herbs and shrubs shading its surface, and binding it together with their very long and widely-spreading roots, is driven by the prevailing winds over the surrounding country, to the destruction of all lowly vegetation; even forest-trees are overwhelmed in the advancing sand-waves. This phenomenon is not confined to the coast-line, but instances, usually on a limited scale, may be found in the interior.

The destructive effect by stock trampling down and consolidating the clay-surfaces around watering-places has already been adverted to; but whilst the whole vegetation in purely pastoral districts is affected more or less by this trampling, yet the effect upon the growth of certain species of grasses is of a more particular kind. Those whose seeds are provided with long awns, such as *Andropogon*, *Aristida*, *Stipa*, &c., are able to penetrate the soil and await the rains to germinate them, while the more valuable and nutritious ones—as, for instance, *Panicum*, *Sorghum*, *Sporobolus*, &c.—being without those special arrangements, are liable to disappear, not alone from the difficulty of obtaining suitable lodgment in the ground, but also from all stock preferring their more succulent stems to the hard siliceous culms of their rivals.

From these causes, overstocking, rabbits, and introduced plants, it appears probable that in the near future the features peculiar to the Australian landscape from its endemic floras will be greatly modified. As, for instance, the aspect of our Pacific slope has been in certain spots much altered by the spread of the cactus, and our water-courses are choked up in various parts of the colonies by the spread of the common water-cress (*Nasturtium officinale*).

The results of overstocking hitherto referred to have been mainly due to sheep. Cattle, although very destructive to some of the shrubby trees, such as Emu-bush or Bitter-bush (*Heterodendron oleaefolia*), Quondong (*Santalum persicarium*), Mulga (*Acacia aneura*), of all of which they are extremely fond, breaking down the branches to reach the young growth, are otherwise not nearly so destructive as sheep; and where not grazed in excessive numbers, the native grasses have greatly increased in quantity, but the influence of big cattle in consolidating the surface soil and making it more retentive affect the native vegetation rather beneficially, and the long paths made in crossing the country often develop into small watercourses, and the vegetation of the lower-lying ground of the drier part is thereby improved.

It is not to be supposed that in pointing out the dire results of overstocking, especially with sheep, that moderate and judicious grazing has the same effect. Of course, the exigencies of bad seasons, with little or no rain, may compel overstocking; but, if not persisted in, the injury done is not permanent, and a few wet years recuperate the pastures.

In newly-stocked country, where the rainfall is light and precarious, the indigenous perennial grasses exist as tufts wide-apart; hence, while the stock is few in numbers and not kept continuously in the same spot, these perennial grasses greatly increased and covered the ground fairly well, but as the stock multiplies the perennial grasses and the shrubs became fewer, or died out, and their place is occupied by annual grasses and herbs. By preference the stock eat the sweetest and best, and the result of much overstocking for lengthy periods is that inferior grasses prevail, as evidenced by the poverty and poor condition of the animals, despite the abundance of feed. An intelligent system of grazing will allow the best grasses to reproduce themselves, and thus secure an increase of the yield of wool and lambs.

Many of the innutritious grasses are importations, and one of the worst is an Indian grass (*Hœmarthria*, sp.), which has spread very widely on the better soils, and is very abundant in the districts near to Sydney, where originally the kangaroo grass (*Anthisteria ciliata*) was common. Of native innutritious grasses species of *Andropogon* and *Aristida* furnish typical examples.

Generally the results of settlement appear on the whole extremely injurious to that portion of our vegetation which comprises the best fodder-producing plants, and that the very existence of the indigenous forests is threatened by the constantly-recurring conflagrations, and it may perhaps be permitted to suggest remedies of a practical nature to mitigate these deplorable effects. In all natural forest-country very extensive forest-reserves ought to be set apart in such a manner as to be beyond

the possibility of resumption by the political heads of the Crown Lands Department of each colony, whose fiscal necessities have frequently caused the public estate to be alienated for the benefit of private individuals. Each reserve would require one forester at least, who should be permanently resident thereon. The boundaries of each forest should be as far as possible natural ones. It is true most of the colonies have now a forest department, but some of the reservations are unsuitable, and those suitable are often too limited in extent ; whilst the resumption of the reservation is too easily obtained.

In respect to the preservation of our exceptionally rich and abundant fodder-plants on areas where the rabbit plague is kept within reasonable limits, graziers will find it entirely to their own interests to encourage the most valuable growth by the adoption of a system of alternate grazing of sheep and cattle on the different divisions of their holdings. Seasons of heavy and continuous rains invariably cause the long-buried seeds to spring in wonderful abundance, and these only require sufficient time to reach a development which will withstand a moderate amount of grazing.

It cannot be too often repeated that the fat-producing quality of our native vegetation, which covered originally all the interior at present stocked, is quite unequalled in the world for its abundance and hardiness to withstand an ordinary drought and it is notorious that stock fed on it will travel hundreds of miles to market without serious deterioration. Unless some such plan is widely acted on it is safe to forecast the extinction of that portion of our vegetation whose great value and importance is due to its economic value as a food for stock, and capable of increasing and multiplying under such conditions of heat or cold, drought or flood, as no other vegetation can possibly do.

The longer this extinction progresses the greater and greater will be the losses entailed by periods of drought, and it has been already demonstrated on an extensive scale that this destruction renders valueless very large tracts of country; and that in other parts, where the rainfall is greater and more regular, the edible shrubs and perennial grasses are liable to be supplanted by annuals and worthless perennial grasses. Hence the preservation of our indigenous flora, whilst looked upon as a fad by the ignorant and unthinking, is really in its cumulative effects one of great national importance—an importance difficult to exaggerate as affecting our food-supplies and the greatest of our sources of exported wealth.

Further Notes on Australian Coleoptera with Descriptions of New Genera and Species.

By the Rev. T. Blackburn, B.A.

XII.

The following pages contain *inter alia* descriptions of a number of new species of *Coccinellidæ*, collected in various parts of Australia by Mr. A Koebele, and sent to me subsequently to the collection dealt with in Part XI of this series of memoirs.

HYDROPHILIDÆ.

BEROSUS.

B. majusculus, Blackb. This appears to be the Southern form of *B. externespinosus*, Fairm. All the South Australian examples I have seen have their legs entirely testaceous, while those from Queensland have their posterior four femora widely black at the base. In both forms the apical spines of the elytra are variable, and I do not find any constant character apart from colour to distinguish the two.

PHILHYDRUS.

P. lævigatus, Blackb. I have recently received from Mr. Tryon, of Brisbane, some examples of *P. maculiceps*, Macl., taken by Mr. Relton. *P. lævigatus* being not unlike it, it may be well to record that besides the colour differences, the maxillary palpi are considerably shorter in *lævigatus* and the puncturation of the elytra is evidently closer, the rows of larger punctures, moreover, being scarcely traceable, whereas in *maculiceps* they are very well defined under a good lens.

DERMESTIDÆ.

TROGODERMA.

T. Reitteri, sp. nov. Ovale; nigro-hirtum; nigrum, antennis pedibus et elytrorum humeris (nonnullorum exemplorum marginibus postice quoque) rufis; obscure sat sparsim punctulatum; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Feminæ (?) antennarum clava 3-articulata. Long., $1\frac{1}{3}$ l.; lat., $\frac{7}{10}$ l.

The distinctive characters of this species are its sparse

puncturation, the conspicuous red blotch on the shoulder, and (in one sex at any rate) the three-jointed club of its antennæ.

N.S. Wales, near Sydney.

T. variipes, sp. nov. Ovale; fulvo-hirtum; nigrum, tibiis tarsis et (nonnullorum exemplorum) elytrorum apice rufis; sat crebre sat fortiter punctulatum; sulcis antennariis profundis bene determinatis, triangularibus, postice clausis.

Maris antennarum clava 4-articulata, articulo clavam præcedenti sat dilatato.

Feminæ clava 4-articulata, articulo clavam præcedenti haud dilatato. Long., $1\frac{1}{5}$—$1\frac{3}{5}$ l.; lat., $\frac{7}{10}$—1 l.

I have examined a considerable number of specimens without detecting any character likely to be sexual except that in the smaller and narrower examples the joint of the antennæ preceding the club is evidently dilated so as to be somewhat intermediate in width between the preceding joints and the first of the club.

S. Australia; near Adelaide.

T. baldiense, Blackb. I am disposed to think that this insect is probably identical with *T. apicipenne*, Reitter. Unfortunately Herr Reitter gives no information as to the structure of the antennæ or their cavities in describing that species, so that it is impossible to feel any certainty; but a recent reconsideration of the nomenclature of the *Dermestidæ* in my collection has resulted in the opinion that the above alteration is probably required.

LAMELLICORNES.

ONTHOPHAGUS.

O. blackwoodensis, sp. nov. Sat nitidus; niger, vix violaceo-tinctus elytris ad apicem (et nonnullis exemplis pygidio) rufo-maculatis, antennis palpis tarsisque rufis vel testaceis; corpore subtus pedibusque minus crebre fulvo-hirsutis, capite prothoraceque fortiter sat crebre punctulatis; hoc æquali, illo antice sat fortiter emarginato; elytris sat fortiter striatis, striis crenulatis, interstitiis leviter convexis, rugulosis.

Maris vertice tuberculum in medio ferenti, sutura clypeali carinata arcuata.

Feminæ vertice carinam transversam angulatam ferenti, sutura clypeali ut maris. Long., $2\frac{1}{4}$ l.; lat., $1\frac{2}{5}$ l.

S. Australia; near Blackwood.

O. henleyensis, sp. nov. Sat nitidus; niger, nonnullis exemplis leviter viridi-tinctis, corpore subtus pedibusque minus dense fulvo- vel cinereo-hirsutis; capite sat fortiter prothorace

crasse sat crebre punctulatis; illo antice fortiter emarginato, emarginaturæ lateribus fortiter productis: elytris sat fortiter striatis, striis crenulatis, interstitiis fortiter convexis sat crasse rugulosis.

Maris vertice cornubus 2 (his rectis, minus elongatis, vix divergentibus, haud ad basin conjunctis) armato, sutura clypeali carinata sat recta.

Feminæ vertice carina transversa arcuata armato, hac ad latera magis elevata, nonnullis exemplis in medio interrupta. Long., 3—$3\frac{1}{2}$ l.; lat., $1\frac{4}{5}$—$2\frac{1}{5}$ l.

S. Australia; Henley Beach and other localities.

O. nitidior, sp. nov. Sat nitidus; niger, vix cupreo-micans, corpore subtus pedibusque minus dense fulvo- vel cinereo-hirsutis; capite crebre prothorace fortiter sat crebre vix crasse nec rugulose punctulatis; illo antice sat fortiter emarginato; elytris sat fortiter striatis, striis crenulatis, interstitiis leviter convexis sat fortiter nec rugulose punctulatis.

Maris vertice lamina erecta transversa instructo, hac supra fortiter arcuatim emarginata; sutura clypeali carinata, vix arcuata.

Feminæ vertice carina transversa angulata instructo, sutura clypeali ut maris. Long., $1\frac{4}{5}$—$2\frac{1}{5}$ l.; $1\frac{3}{10}$—$1\frac{2}{5}$ l.

The frontal lamina of the male is so deeply emarginate that its two ends stand up almost like horns when looked at from a certain point of view.

N.S. Wales; taken by Mr. Sloane near Mulwala.

APHODIUS.

A. Tasmaniæ, Hope. Harold (Berl. Zeit., 1861, p. 94) redescribed this species very fully, and pointed out that *A. Howitti* is a variety of the same. He, however, says nothing about the sexual characters, having, I presume, only one sex (evidently the female) before him. The male differs by its very much wider prothorax, which to a casual glance appears considerably wider than the elytra, but is in reality just the same width as the widest part of the elytra; the prothorax of the male, moreover, is much less strongly punctulate than that of the female, and the anterior tibiæ are much narrower and more elongate with their external teeth, though not much shorter, yet evidently narrower so as to be more widely separated one from another. The prothorax of the female to a casual glance appears of the same width as the elytra, but measurement shows it considerably narrower than the widest part of the elytra.

A. yorkensis, sp. nov. Mas. Sat parallelus; nitidus; in lateri-

bus longe ciliatus; rufo-ferrugineus, antennis palpisque flavis; capite grosse punctulato, clypeo antice truncato, lateribus rotundatis integris; prothorace subquadrato, quam longiori quinta parte latiori, quam elytra latiori, æqualiter subtiliter nec crebre punctulato, basi marginata; scutello modico punctulato (ut *A. Tasmaniæ*); elytris crenato-striatis interstitiis sparsissime punctulatis leviter convexis; pedibus minus elongatis, tibiis anticis valde arcuatis, extus tridentatis, dentibus inferioribus 2 permagnis, dente superiori parvo.

Feminæ prothorace multo minore, quam longiori dimidio latiori, quam elytra angustiori, sat fortiter punctulato; tibiis anticis fere rectis, dentibus inferioribus minoribus, superiori majori. Long., 4—5½ l.; lat., 1⅔—2⅔ l.

At once distinguished from *A. Tasmaniæ*, Hope, by the lateral margin of the prothorax being evenly continued along the base. The prothorax of the male is very large and massive, being not very much smaller than the elytra. The head is evidently more coarsely punctulate than that of *A. Tasmaniæ*; it has a fairly-well marked tubercle in front of each eye, but no defined elevation on the median part.

S. Australia; Yorke's Peninsula.

MÆCHIDIUS.

M. tibialis, sp. nov. Minus elongatus, subovalis; sat nitidus; rufus, capite elytris pedibusque obscurioribus; capite antice fortiter triangulariter exciso, clypeo medio longitudinaliter carinato, lateribus sinuatis; prothorace fortiter transverso, antice sat fortiter angustato, leviter sat crasse nec crebre punctulato, lateribus leviter sat æqualiter arcuatis, angulis omnibus acutis (posticis retrorsum directis); elytris leviter striatis et obscure geminatim seriatim nec crebre granulatis; femoribus sat dilatatis; tibiis anticis extus dentibus 3 sat magnis sat æqualibus (inferioribus 2 approximatis, a tertio sat remotis) armatis; tibiis posterioribus 4 robustis, in medio transversim carinatis, ad apicem extus lobato-productis, lobo truncato articulo tarsorum basali longitudine æquali; unguiculis simplicibus; elytris propygidium haud tegentibus, pygidio longitudinaliter carinato. Long., 4 l.; lat., 2 l.

The femora and tibiæ of this species resemble those of some *Liparetri* (e.g., *L. ordinatus*, Macl.), but the apical prolongation of the external margin of the posterior four tibiæ is more like that of some *Dynastides* (e.g., *Cryptodus paradoxus*, Macl.). The exposed propygidium is a character I have not seen in any normal *Mœchidius*. The general facies is quite that of *Mœchidius*, as also the structure of the head, sterna, &c. (so far as I can see without dissection); the antennæ fall into prosternal cavities

exactly as in *Mæchidius*. I should be inclined to propose a new generic name for this species if it were not that Mr. Waterhouse has already characterised a genus *(Epholcis)* very near *Mæchidius*, but without referring to the structure of the legs or the length of the elytra in its species, so that I cannot be quite sure this insect might not be referred to it. It is better therefore, for the present, to regard it as an extreme form of *Mæchidius*.

N.S.W.; taken by Mr. Froggatt near Bungendore in a nest of *Termitidæ*.

PSEUDORYCTES.

P. tectus, sp. nov. Rufo-ferrugineus, sat nitidus; subtus dense fulvo-pubescens; capite minus parvo; scutello punctulato minus transverso, tibiis extus bicarinatis.

Maris prothorace quam elytra subangustiori, tota superficie excavato, parte excavata dense hirsuta, margine antico cornu magno (hoc supra caput antrorsum producto et ad apicem sursum reflexo, apice profunde bilobo, lobis extrorsum oblique directis) armato, utrinque in cornu elongato valido (hoc ad apicem acutum introrsum curvato) producto; antennarum flabello valde elongato quam stipes vix breviori; tarsis elongatis. Long., 10 l.; lat., $5\frac{1}{2}$ l.

Femina latet.

I think this species may be referred to *Pseudoryctes*, although its tarsi are evidently longer than those of *P. mullerianus*, White, and the upper carina of its tibiæ is much more developed than in that species.

Australia; a single specimen in the S.A. Museum; its exact habitat not known.

BUPRESTIDÆ.

ASTRÆUS.

A. navarchis, Thoms. M. J. R. H. Neervoort van de Poll, in his Monograph of *Astræus*, gives merely "Australia" as the habitat of this species. I have seen an example in the collection of C. French, Esq., which that gentleman informs me was taken in Western Australia. M. Thomson gave Tasmania as the habitat, but I take it that this was a mistake.

A. Oberthüri, V. de Poll. The exact habitat of this species also seems to have been unknown to M. van de Poll. Mr. French gives Queensland as the locality, where an example in his collection was taken.

A. simplex, sp. nov. Sat elongatus; nitidus; pube albida nisi in elytris vestitus; capite prothoraceque nigris, hoc ad latera illo antice viridi-cyaneis, elytris cyaneis maculis quaternis

flavis ornatis, corpore subtus viridi, antennis nigris, pedibus viridibus, tibiis apicem versus tarsisque testaceis, his paullo infuscatis; capite ruguloso, in fronte linea elevata glabra; prothorace convexo, canaliculato, fortiter sat æqualiter punctulato; elytris costatis, interstitiis planis, apicibus fortiter divergentibus, spinis suturalibus marginalibusque validis. Long., $4\frac{2}{5}$ l.; lat., $1\frac{4}{5}$ l

The yellow spots on the elytra are as follows:—One basal subcircular, one marginal ante median much like the corresponding spot in *A. Samouelli*, one post median fasciaform but not nearly reaching the suture, one half-way between the last mentioned and the apex rotundate. The fig. of *A. dilutipes*, V. de Poll (Tijd, voor Ent. XXXII., pl. iii., fig. 17) would represent this species if the spots near the middle of the suture were removed, the apical spots brought forward, and the legs differently coloured.

S. Australia; in the collection of C. French, Esq.

BUBASTODES (gen. nov.).

Bubasti similis sed antennis brevibus, foveis poriferis in articulorum facie interna positis; scutello perparvo.

I think this genus is allied to *Bubastes*, which it closely resembles in its cylindric and robust appearance and general style of colours, pattern, and sculpture; but its antennæ are those of a *Chrysobothris*, and its scutellum is little more than punctiform. In the example before me the basal ventral segment is longitudinally sulcate.

B. sulcicollis, sp. nov. Robusta; subcylindrica; sat nitida; supra vix perspicue, subtus sparsim breviter, pubescens; obscure ænea, elytris viridibus (certo adspectu obscure cupreo-micantibus); capite convexo crasse ruguloso in medio longitudinaliter carinato, clypeo antice fortiter emarginato; prothorace quam longiori dimidio (postice quam antice quarta parte) latiori, late profunde canaliculato, crasse nec crebre (latera versus sat crebre) umbilicato-punctulato, lateribus fortiter rotundatis, margine antico leviter sinuato-emarginato postico leviter bisinuato, angulis anticis acute vix productis posticis subrectis; elytris inæqualiter minus fortiter punctulato-rugulosis, striatis, lateribus haud crenulatis, ad apicem oblique obsolete emarginatis; corpore subtus in medio pedibusque sparsim crasse, illo ad latera crebre magis subtiliter, punctulato-rugulosis. Long., $7\frac{1}{2}$ l.; lat., $2\frac{3}{5}$ l.

The description of *Castalia globithorax*, Thoms. (which its author thought might form a new genus), suggests the probability of its being congeneric with this insect, but it is evidently not

conspecific, as M. Thomson's species is said to have an impressed line on the head, and its prothorax "confertim punctulatus."

S. Australia.

NEOBUBASTES (gen. nov.).

Bubasti similis sed minus convexus, pronoti carina marginali fere integra.

This species is another ally of *Bubastes*, but incapable of being referred to that genus on account of the lateral carina of its pronotum (which in *Bubastes* is very short and entirely on the under surface) being well defined, visible from above, and continuous almost to the front margin. Beyond its somewhat less cylindric (though equally robust and scarcely less parallel) form I do not find any other character likely to be a generic distinction from *Bubastes*.

N. aureocincta, sp. nov. Robusta; sat parallela; minus convexa; sat nitida; setis albidis supra sparsissime subtus magis crebre, vestita; ænea, capite prothoraceque viridi cupreoque vix manifeste micantibus, elytris læte viridibus, marginibus basalibus lateralibusque splendide aureis, his intus igneo-cupreo mutantibus; capite convexo crebre fortiter ruguloso-punctulato; prothorace quam longiori fere duplo (postice quam antice fere tribus partibus) latiori, supra æquali, crebre fortiter (fere ut caput sed antice magis subtiliter) ruguloso-punctulato, antice sinuato-emarginato postice bisinuato, lateribus sat rotundatis, latitudine majori ante medium posita, angulis anticis obtusis haud productis posticis fere rectis; scutello concavo; elytris quam prothorax vix latioribus, minus fortiter minus crebre (latera versus magis crebre magis rugulose) ruguloso-punctulatis, fortiter striatis, postice ad latera crenulatis, ad apicem rotundato-truncatis; corpore subtus pedibusque crebre fortiter (femoribus minus fortiter) punctulatis. Long., 8 l.; lat., 3 l.

Var. ? *scutalis* differt statura multo minore (long., 6 l.) corpore subtus pedibus capite prothorace læte cæruleis, hoc in disco obscuriori, scutello planato.

MacDonnell Ranges, Central Australia; in the collection of C. French, Esq. The var. ? *scutalis* is in my own collection, and was taken in S. Australia, but I do not know its habitat more exactly.

BUBASTES.

B. vagans, sp. nov. Cylindrica; minus nitida; obscure viridis, elytris obscure cupreo-purpureis, antennis femorum apice tibiis tarsisque igneo-cupreis; corpore subtus sparsim cinereo-pubescenti; capite inter oculos haud concavo, vertice linea subtili longitudinali impresso, crebre fortiter rugulose

punctulato ; prothorace quam longiori circiter tertia parte latiori, sat crebre (latera versus magis crasse rugulose) punctulato ; elytris crebre subtilius rugulose punctulatis, striatis, interstitiis inæqualiter convexis piceis sparsim magis fortiter punctulatis, apice emarginatis et bispinosis, Long., 9 l. ; lat., $2\frac{4}{5}$ l.

A narrower and more elongate species than *B. inconsistans*, Thoms., with the sides of the prothorax quite straight and parallel from the base nearly to the front margin, and the disc of the same much less closely punctulate. These same characters also furnish distinction from *B. globicollis*, Thoms. *B. sphenoida*, L. & G., is said to have the prothorax canaliculate ; in the other described species the head is concave or foveate between the eyes.

S. Australia ; sent to me by Mr. Masters.

CURIS.

C. discoidalis, sp. nov. Sat elongata ; sat convexa ; nitida ; supra læte viridis, capite prothoracis disco et in elytris macula magna discoidali communi (hac a basi late, a marginibus lateralibus minus late distanti) purpurascentibus, corpore subtus femoribus tibiisque viridibus, antennis tarsisque purpurascentibus ; capite longitudinaliter concavo, fortiter punctulato ; prothorace transverso, vix canaliculato, punctulato (antice in medio subtiliter, basin lateraque versus magis crasse), lateribus sat rotundatis ; elytris postice rotundato-truncatis, abdomen fere tegentibus, fortiter punctulatis, vix manifeste costatis, juxta latera striatis (interstitiis hîc subcarinatis), lateribus prope apicem apiceque denticulatis ; sternis sat æqualiter subfortiter nec crebre, abdomine fortiter sat crebre, punctulatis. Long., $5\frac{1}{2}$ l. ; lat., 2 l.

Resembles *C. Peroni*, Fairm., and *despecta*, Fairm., in build, but the elytra are not distinctly costate, and the middle of the prosternum is quite strongly punctulate, uniformly with the metasternum, but less coarsely than the side-pieces of the prosternum. The purple colouring on the prothorax consists of a wide median vitta (divided down the middle) occupying the middle one-third of the width ; on the elytra it consists of a large common spot triangularly emarginate in front (so that its front comes near the base at the shoulders, and on the suture is distant from the scutellum nearly a third of the length of the suture), and separated from the lateral margin on either side by nearly a third of the width of each elytron. In the type the green colour of the elytra is of a very rich pure shade in front, but along the margins becomes golden and then coppery in tone hindward. The prothorax, compared with that of *C. caloptera*,

Boisd., is shorter, and has more strongly rounded sides; it is slightly narrower than the widest part of the elytra; it is extremely like that of the species which I believe to be *C. intercribrata*, Fairm., in all respects except in the median channel being scarcely marked. The puncturation of the elytra is very much stronger than in *C. caloptera*, Boisd.

W. Australia; near Yilgarn; in the collection of C. French, Esq.

CYRIA.

C. tridens, Blackb. In describing this species (vide supra, p. 41) I omitted to mention its habitat, which is Richmond River District, N.S. Wales. Mr. French tells me that it is the insect on which the name *C. gagates* was founded. It is impossible to form a decided opinion on the point by reading the *description*—which does not even mention the colour of the elytra (unless the term "nigra" applied to the insect in general is to be strictly applied to every part except the eyes—in which case there would be no reason to connect *C. tridens* with it)—but I have no doubt Mr. French's memory is trustworthy in the matter—and, indeed, I had thought of the question of identity with *gagates* when I described *tridens;* but it is of little consequence, for, as far as I can ascertain, no description of *C. gagates* has ever been published, the name occurring in a privately-circulated memoir of the late Rev. W. F. Hope. The species I named *tridens* is certainly distinct from *C. imperialis*, Don., of which *gagates* is said to be a variety.

HYPOSTIGMODERA gen. nov.

Gen. *Stigmoderæ* valde affinis; differt maris antennis biflabellatis.

The extraordinary insect on which I found this genus seems to be a perfectly typical *Stigmodera* in all respects except that the antennæ of the male are strongly biflabellate, resembling very closely those of the male in the *Elaterid* genus *Euphemus*; the antennæ of the female are those of an ordinary *Stigmodera*.

H. variegata, sp. nov. Minus elongata; supra cœruleo-nigra, elytris paullo pone basin fascia lata communi (et paullo ante apicem macula sat magna) testaceis ornatis; subtus sat læte cœrulea vix viridimicans, cum pedibus concolor; capite longitudinaliter sulcato sat crebre sat fortiter punctulato; prothorace quam longiori dimidio latiori, distincte (præsertim pone medium) canaliculato, quam caput paullo magis crebre minus fortiter punctulato; elytris postice bidentatis sat fortiter striatis, interstitiis sat crebre sat fortiter punctulatis 1° 3° 5° que (antice et postice sat fortiter in medio minus evidenter) quam cetera magis convexis, later-

ibus haud denticulatis ; corpore subtus sat fortiter (prosterno fortiter vix crebre, segmento ventrali apicali quam cetera multo magis fortiter magis crebre) punctulato. Long., $4\frac{1}{2}$—$4\frac{3}{4}$ l. ; lat., $1\frac{1}{2}$—$1\frac{4}{5}$ l.

This species is extremely like *Stigmodera bella*, Saund., in shape and sculpture ; so much so that it would be difficult to specify any difference in these respects, except that each elytron is terminated by two *almost equal* teeth, that the head is more elongate, and the ventral segments somewhat differently sculptured. The markings of the elytra are very different from those of *S. bella*, consisting of a very wide common testaceous fascia commencing nearer to the base than that of *S. bella*, and extending nearly to the middle of the elytra, with both its front and hind margin sinuous, and a testaceous spot on each elytron considerably before the apex (nearly round in the male example before me, transversely elongate in the female), touching neither lateral margin nor suture.

Queensland ; Darling Downs ; in the collection of Mr. French.

STIGMODERA.

S. cara, sp. nov. Mas. Sat elongata ; splendide cuprea, elytris testaceis, horum basi sutura (his anguste) apice et fasciis 2 (altera subbasali altera pone medium posita) purpureis plus minusve viridi-tinctis, abdomine rufo-testaceo viridi-micanti, antennis viridibus ; capite longitudinaliter concavo fortiter sat crebre punctulato ; prothorace quam longiori duabus partibus (postice quam antice fere duplo) latiori, inæqualiter punctulato (sc. basi media fortiter minus crebre, latera versus crebre rugulose, antrorsum gradatim magis crebre magis subtiliter), lateribus postice fere parallelis antice arcuatim convergentibus, basi subangulatim bisinuata, angulis anticis acutis sat productis posticis sat rectis ; elytris ad apicem oblique sat minute emarginatis et biapiculatis, punctulato-striatis, interstitiis obscure transversim rugatis et subtiliter punctulatis, lateribus postice sat fortiter denticulatis, basi subangulatim sinuata ; corpore subtus breviter argenteo-pubescenti ; prosterno antice confertim rugulose (inter coxas grosse sparsim), metasterno fortiter minus crebre, abdomine leviter crebre (segmento basali medio fortiter minus crebre), punctulatis. Long., $6\frac{3}{4}$ l. ; lat., $2\frac{1}{2}$ l.

Resembles *S. Burchelli*, L. and C. in size and shape, and in the puncturation, &c., of the upper surface ; differing from it, however, in the angulate sinuation of the base of the elytra, in the denticulate sides of the elytra near the apex, and the much smaller apical emargination of the same. The dark fasciæ on the elytra are as follows :—A narrow bright-green base, a greenish-

purple fascia (very narrowly separated from the base) of moderate width, a narrower fascia of purple colour immediately behind the middle, and the apex to the extent of about one-seventh the length of the elytra. The testaceous greenish-glossed abdomen is very distinctive.

Queensland; Darling Downs; in the collection of Mr. French.

S. insignis, sp. nov. Depressa, minus angusta; supra niger, elytris mox ante medium fascia testacea nec marginem nec suturam plane attingenti et ante basin macula magna reniformi sanguinea marginem nec suturam attingenti ornatis, corpore subtus aureo viridi, pedibus antennisque cæruleis; capite longitudinaliter late profunde concavo fortiter minus crebe punctulato; prothorace trans basin quam longiori (et postice quam antice) paullo plus quam dimidio latiori, sparsim subtiliter punctulato, intra angulos posticos foveolato, antice fortiter emarginato, postice in media lobato, lateribus a basi ad apicem (vix arcuatim) angustatis; elytris postice angustato-productis, ad apicem late oblique emarginatis et bispinosis (spina externa majori), pone medium dilatatis, punctulato-striatis, interstitiis sublævibus alternis fortiter convexis, lateribus inermibus, basi late leviter convexa; corpore subtus sparsim pubescenti, sat fortiter minus crebre (retrorsum gradatim magis subtiliter magis crebre) punctulato. Long., 7 l.; lat., $2\frac{2}{5}$ l.

Near *S. producta*, Saund., but differing *inter alia* by the absence of a prothoracic channel and of a red spot near the base of each elytron. *S. acutipennis*, Thoms., is described as having a red spot near the base of each elytron. The subapical spot in the present species is kidney shaped, lying along the lateral margin for a distance equal to about a third of its length, with its two lobes directed towards the suture.

Victoria; taken by C. French, Esq.

S. filiformis, sp. nov. Elongata; parallela; minus convexa; glabra; læte viridis, capite prosternoque aureo-micans, elytris sanguineis ad basin anguste viridibus violaceo-ornatis (macula oblongo utrinque subhumerali, sutura apice excepto, fascia post-mediana sinuata communi margines haud attingenti, et macula communi, subapicali trilobata); capite prothoraceque crebre subtiliter (fere ut *S. sanguinolentæ*, L. and G) punctulatis; illo angusto fortiter producto, fere plano, in vertice canaliculato; prothorace quam longiori quinta parte (postice quam antice tertia parte) latiori, antice leviter emarginato, postice in medio late leviter lobato, lateribus leviter arcuatis; elytris ad apicem leviter oblique emarginatis et biaculeatis, punctulato-striatis, interstitiis

sparsim punctulatis antice planis postice convexis, lateribus inermibus; corpore subtus subtilius sat sparsim (prosterni lateribus crebre rugulose, metasterno subfortiter) punctulatis. Long., $4\frac{1}{2}$ l.; lat., $1\frac{2}{5}$ l.

A slight dilatation of the suture opposite the subhumeral spots suggests the possibility that there may be varieties of this species in which the subhumeral spots are joined to the suture. None of the violet markings on the elytra touch the suture. The subapical common spot resembles a club (in a pack of cards), with one of the lobes directed towards the apex and one spreading out on each elytron. This is an exceptionally narrow elongate species; compared with *S. sanguinolenta* (apart from very different markings) its head is narrower and more produced, its form considerably narrower, its underside glabrous and much less closely punctured, &c. Its very narrow form and glabrous undersurface at once distinguish it from *amphicroa*, Boisd., its scarcely transverse prothorax from *Sieboldi*, L. and G.

W. Australia; in the collection of C. French, Esq.

S. capucina, sp. nov. Minus convexa, sat lata; supra rufa, capite prothoracis marginibus et macula magna antica (hac cucullum simulanti) scutello elytrorumque basi summo et apice summo æneis, corpore subtus antennis pedibusque æneis, abdominis lateribus flavomaculatis, hujus segmento apicali postice toto flavo; capite medio canaliculato sat crebre sat fortiter (fere ut *S. Brucki*) punctulato, oculis sat remotis; prothorace minus nitido, quam longiori tribus partibus (postice quam antice duplo) latiori, inæqualiter sat crebre rugulose (fere ut *S. Stevensi* sed paullo minus rugulose) punctulato, fere æquali, linea mediana fere lævi, antice sinuatim emarginato, postice subbisinuato, lateribus fortiter rotundatis, latitudine majori mox pone medium posita; elytris ad apicem rotundatis, pone humeros leviter sinuatis, fortiter sat æqualiter punctulato-striatis, interstitiis convexis sparsim punctulatis, lateribus inermibus, basi fere truncata; corpore subtus fere glabro; prosterno confertim rugulose (processu prosternali sparsim subtiliter excepto), metasterno abdomineque ad latera crebre rugulose (metasterno medio sparsim subtiliter, abdomine medio sat crasse minus crebre), punctulatis; metasterno medio profunde longitudinaliter sulcato. Long., 13 l.; lat., 5 l.

Near *S. Wimmeræ*, Blackb., but narrower, with the base of the elytra almost perfectly straight, also the colours different.

W. Australia; in the collection of C. French, Esq.

S. regia, sp. nov. Modice convexa; sat lata; subparallela; sat elongata; capite viridi, prothorace fere nigro ad latera late

aurantiaco, elytris in parte dimidia antica aurantiacis fascia communi lata cyaneo-nigra (hac margines haud attingenti) ornatis, in parte dimidia postica cyaneo-nigris utrinque macula transversa aurantiaca ornatis, corpore subtus in medio pedibusque læte viridibus (illo ad latera aurantiaco), segmentis ventralibus intermediis ad latera macula parva viridi utrinque ornatis, segmen to ventrali apicalitoto aurantiaco (hoc postice in medio viridi); capite leviter convexo crebre (fere ut *S. variabilis*) punctulato, vertice linea longitudinali impresso, oculis sat approximatis; prothorace quam longiori et postice quam antice tribus partibus latiori, fere ut *S. variabilis* sed paullo minus rugulose punctulato, antice leviter sinuatim emarginato, postice subbisinuato, lateribus a margine antico fere ad basin arcuatim divergentibus, latitudine majori paullo ante basin posita; elytris ad apicem ut *S. variabilis* truncato-emarginatis, pone humeros sat fortiter sinuatis, antice leviter postice magis fortiter punctulato-striatis, interstitiis sparsim subtiliter punctulatis, alternis foveolatis, alternis postice angustioribus magis convexis, lateribus inermibus, basi sinuato-truncata; corpore subtus ad latera crebre subtilius (metasterno coxisque posticis creberrime subtiliter) in medio sparsim punctulato; pectore sat hirsuto, metasterno medio profunde longitudinaliter sulcato. Long., 16 l.; lat., $6\frac{1}{2}$ l.

The markings on the elytra are extremely like those of *S. Fortnumi*, Hope, but with the dark colour much more obscure, the front dark fascia more produced forward on the shoulder, the median dark fascia much narrower and the postmedian orange spot less strongly transverse in form; the prothorax also is almost exactly like that of *S. Fortnumi* in shape and sculpture; the general form much narrower and more parallel, the apices of the elytra much less straightly truncate and less strongly spined, the alternate interstices of the elytra foveolate, &c., will separate this species from *Fortnumi*. It also resembles some forms of *S. variabilis*, Don., from which it is at once distinguished by its prothorax much more narrowed anteriorly and therefore appearing to a casual glance less transverse. The example before me is a female, and therefore is compared above with females of *Fortnumi* and *variabilis*.

N. Queensland; in the collection of C. French, Esq.

S. ignea, sp. nov. Minus lata; minus depressa; igneo-cuprea, elytris testaceis, sutura (hac pone medium bis dilatata) et in elytris singulis linea obliqua subhumerali maculaque sublaterali pone medium posita viridibus; capite sat elongato fortiter sat crebre punctulato, longitudinaliter profunde concavo; prothorace

quam longiori (et postice quam antice) fere duabus partibus latiori, fortiter sat crebre (antice magis subtiliter, latera versus rugulose magis crebre) punctulato, antice bisinuatim vix emarginato, lateribus sat rotundatis, basi media late obsolete lobata, angulis posticis fere rectis ; elytris sat fortiter striatis, striis vix distincte punctulatis, interstitiis leviter convexis obscure punctulatis, ad apicem oblique leviter emarginatis, lateribus postice denticulatis ; corpore subtus setis brevibus crassis sparsim vestito, crebre sat fortiter (sternis in medio magis fortiter sat sparsim exceptis) punctulato. Long., $5\frac{1}{2}$—6 l. ; lat., 2—$2\frac{1}{5}$ l.

The green markings on the elytra appear black in a certain light ; the sutural colouring is dilated considerably on either side of the scutellum, and is dilated into a large spot a little behind the middle, and into a small one just before the apex. The postmedian sublateral spots are level with the larger dilatation of the suture.

S. Australia.

S. dawsonensis, Blackb. I think this will probably prove to be a var. of *S. liliputana*, Thoms.; it is, however, so unlike the type in respect of its markings that it may well retain a distinctive name.

AGRILUS.

A. Terræ reginæ, sp. nov. Læte viridis, elytrorum vitta subsuturali mesosterno metasterni lateribus et abdominis parte dorsali superiori aureo-pulvinatis ; capite (antice transversim, postice longitudinaliter) rugato ; prothorace sat transverso postice angustato, minus fortiter canaliculato, transversim crebre rugato ; elytris confertim subtiliter subrugulosis, apice rotundatis. Long., 3 l.; lat., $\frac{4}{5}$ l. (vix).

Queensland ; sent to me by Mr. Masters.

MALACODERMIDÆ.

SELENURUS.

S. variegatus, sp. nov. Elongatus ; capite (hoc ante oculos flavonotato) palpis pedibus segmento apicali scutello antennisque nigris (harum articulis 8° 9° que plus minus albidis) ; prothorace nigro, trans basin flavo (parte nigra retrorsum carinam in partem flavam utrinque emittenti) ; elytris cœruleis flavo-bifasciatis, fascia altera antemediana communi arcuata altera postmediana forma variabili, segmentis dorsalibus postice late flavis, corpore subtus flavo plus minusve nigro-notato ; mandibulis appendiculatis nec intus dentatis ; antennis quam corporis dimidium paullo longioribus (maris) vel paullo brevioribus (feminæ) subfiliformibus, articulo 2°

minimo, quam hic 3' duplo longiori, quam 3ms ceteris fere duplo longioribus inter se sat æqualibus; oculis modice prominulis; capite prothoraceque crebre subtilissime punctulato, illo medio planato; palporum maxillarium articulo ultimo præcentibus 2 conjunctis æquali, leviter obtuse elongato subcultriformi; prothorace quam longiori vix latiori, plus minusve perspicue canaliculato; elytris crebre rugulosis, abdominis segmenta apicalia 2 vel 3 aperientibus, postice plus minusve dehiscentibus, apice singulatim rotundatis; pedibus elongatis sat gracilibus, tarsorum posticorum articulo basali quam sequentes 2 conjuncti vix breviori; unguiculis granulo basali setifero subtus munitis.

Maris segmento apicali filamento contorto testaceo utrinque instructo; mandibulis extus testaceis. Long., $4\frac{1}{2}$– $6\frac{1}{2}$ l.; lat., $\frac{4}{5}$—$1\frac{2}{5}$ l.

The above detailed account of the structural characters is rendered necessary by the brevity of the generic diagnosis of *Selenurus*, which omits *inter alia* all reference to sexual characters. The species before me seems to differ from *Ichthyurus* by its mandibles (which are truncate close to the apex, and have a short acute appendiculate piece attached to the outer part of the truncate end) by its longer and less dehiscent elytra, and by the intermediate legs devoid of sexual character. I suspect it is congeneric with *Ichthyurus depressicollis*, Macl.

N. S. Wales; Blue Mountains.

S. sydneyanus, sp. nov. Elongatus; capite nigro (maris antice flavo, feminæ ad antennarum basin flavo-maculato), mandibulis flavis, antennis palpisque nigro-piceis (illarum articulis basalibus subtus rufis), prothorace flavo antice fascia nigra ornato, elytris obscure viridibus, pedibus nigro-piceis (tibiis anticis plus minusve dilutioribus), corpore subtus sordide flavo (metasterno medio nigro et abdomine plus minusve piceo-notato); prothorace haud canaliculato; elytris abdominis segmenta apicalia 3 vel 4 aperientibus; cetera ut *S. variegati*. Long., 2—$3\frac{1}{2}$ l.; lat., $\frac{2}{5}$—$\frac{3}{5}$ l.

This species is evidently congeneric with the preceding. I find no difference in its structural characters.

N. S. Wales; in the suburbs of Sydney.

HETEROMASTIX.

H. anticus, sp. nov. Mas. Niger, capite prothorace antennis palpis pedibusque læte rufo-testaceis; pubescens; capite prothoraceque nitidis vix perspicue punctulatis; hoc transverso antice vix angustato, lateribus leviter arcuatis; elytris

crebre minus fortiter punctulatis ; antennis quam corpus sat brevioribus, sat robustis, articulis 3-5 sat dilatatis.

Feminæ antennarum articulis 3-5 haud dilatatis, articulis singulis apicem versus infuscatis. Long., $1\frac{4}{5}$ l. ; lat., $\frac{3}{5}$ l.

In one of the male examples before me the base of the hind femora is lightly infuscate. Easily distinguished from its allies by the entirely bright rufous colour of the head, prothorax, antennæ, palpi, and legs—except the base of the hind femora as mentioned above.

N. S. Wales ; Blue Mountains.

H. dilataticollis, sp. nov. Niger, antennarum basi prothorace pedibus anticis tibiisque ceteris testaceis ; pubescens ; capite prothoraceque alutaceis ; hoc transverso ante medium fortiter angulatim dilatato ; elytris crebre rugulose sat subtiliter punctulatis ; antennis sat gracilibus quam corpus sat brevioribus. Long., $1\frac{4}{5}$ l. ; lat., $\frac{3}{5}$ l.

Near *Telephorus pusio*, Gemm. (which is, I think, a *Heteromastix*), but differing from it by its larger size, the testaceous colour of the basal three joints of its antennæ, the entirely testaceous front legs, the testaceous hinder four tibiæ, and the stronger angular dilatation of the sides of its prothorax. I have both sexes of *H. pusio* before me, which differ little *inter se* except in the usual different shape of the apical ventral segment and the longer and stouter antennæ of the male.

N.S. Wales ; Blue Mountains.

CLERIDÆ.

LEMIDIA.

L. pictipes, sp. nov. Minus elongata ; fulvo pubescens et setis erectis obscuris vestita ; nigra, subcyanea, capite antice antennis (apice piceo excepto) femoribus anterioribus 4 genubus posticis et tibiis anticis flavis, prothorace rufo ; prothorace sublævi, leviter transverso, lateribus fortiter rotundatis ; elytris grosse nec seriatim punctulatis. Long., $1\frac{3}{5}$ l. ; lat., $\frac{7}{10}$ l.

N.S. Wales ; Blue Mountains.

L. simulans, sp. nov. Minus elongata ; pallide pubescens et setis erectis obscuris vestita ; nigra : capite antice, palpis, antennis, elytrorum basi macula communi subbasali (cum basi connexa) maculaque postmediana (hac suturam vix marginem lateralem nullo modo attingenti), pedibusque (horum tibiis tarsisque posticis infuscatis), flavis ; capite prothoraceque sparsim sat grosse punctulato ; hoc quam latiori vix longiori, lateribus fortiter rotundatis ; elytris grosse seriatim punctulatis. Long., $2\frac{2}{5}$ l. ; lat., $\frac{4}{5}$ l.

Resembles *L. bella*, Westw., in the markings of the elytra, but, *inter alia*, is a less elongate species, with the prothorax black and sparsely sprinkled (together with the hind part of the head) with large coarse punctures.

S. Australia; Port Lincoln.

L. munda, sp. nov. Sat elongata; setis brevibus et nonnullis valde elongatis sat sparsim vestita; picea, capite antennis palpis prothorace et pedibus anticis plus minusve flavescentibus; elytris in parte dimidia basali læte brunneis, fasciis binis angustis (sc. altera basali altera mediana) niveis nitidis ornatis; capite prothoraceque fere lævibus; illo inter oculos fortiter biimpresso; hoc quam latiori longiori, pone apicem valde constricto lateribus fortiter rotundatis; elytris sparsim grosse (apicem versus magis etiam sparsim) punctulatis; pedibus valde gracilibus elongatis. Long., $1\frac{3}{5}$ l.; lat., $\frac{1}{2}$ l.

A remarkable looking little species on account of its very long slender legs resembling those of a *Clytus*, the hind femora reaching back beyond the apex of the hind body. The colouring too is peculiar, more or less yellowish in front of the elytra, with the front half of those organs pale-brown, and the other half nearly black, a raised shining-white ivory-like fascia across the middle, and a somewhat similar one (but not raised) across the base. The constriction across the front part of the prothorax is unusually strong.

S. Australia; Port Lincoln.

L. soror, sp. nov. Minus elongata; setis minus elongatis et nonnullis valde elongatis pallidis sat sparsim vestita; nigra, capite antennis pedibus anterioribus 4 (his nonnullis exemplis plus minusve infuscatis vel rufescentibus), et elytrorum basi apice fasciaque mediana flavescentibus; capite prothoraceque fere lævi; hoc quam longiori vix latiori, lateribus fortiter rotundatis; elytris grosse seriatim punctulatis. Long., $1\frac{4}{5}$—$2\frac{1}{5}$ l.; lat., $\frac{3}{5}$—$\frac{4}{5}$ l.

Much like *L. concinna*, Gorham, but with an apical spot on the elytra, the median fascia yellowish and not raised above the surface, and the surface bearing fairly regular rows of large conspicuous punctures.

S. Australia; Port Lincoln; also near Petersburg.

L. pulchella, sp. nov. Minus elongata; fulvo-pubescens et setis elongatis obscuris vestita; nigra; antennarum basi, prothorace (macula magna antica picea excepta) et abdomine (apice excepto), rufis; tibiis tarsisque anterioribus 4 obscure rufescentibus; elytris læte viridibus; capite (parte media inter oculos fere lævi excepta) sat crebre punctulato, inter oculos profunde biimpresso, prothorace quam longiori vix

latiori, sparsissime sat fortiter punctulato, lateribus fortiter rotundatis ; elytris confertim subfortiter subrugulose punctulato. Long., $2\frac{1}{2}$ l. ; lat. 1 l. (vix).

A very beautiful species, perhaps nearest (but not very near) to *L. biaculeatus*, Westw.

Victoria ; Alpine district.

L. angustula, sp. nov. Fere filiformis ; pallide pubescens, et setis elongatis obscuris vestita ; nigra ; capite, antennis, palpis, prothorace, pedibus anticis, genubus tibiis tarsisque intermediis, et elytrorum basi apice maculisque binis postmedianis linearibus obliquis, rufo-testaceis ; capite leviter obscure, prothorace minus perspicue, punctulatis ; hoc quam latiori paullo longiori, lateribus minus fortiter rotundatis ; elytris sat crebre sat grosse seriatim punctulatis. Long., $2\frac{2}{5}$ l. ; lat., $\frac{3}{5}$ l.

A remarkably narrow and elongate species, not very near, I think, to any previously described.

Victoria.

L. leoparda, sp. nov. Minus elongata ; sparsim nigro-hirta ; nigra, capite prothorace elytris abdomineque rufis, elytris maculis 7 (ex his una communi) nigris ornatis et ad apicem nigro-marginatis ; capite prothoraceque sparsissime punctulatis ; hoc quam longiori vix latiori, pone apicem valde constricto, lateribus fortiter rotundatis ; elytris obsolete vix seriatim punctulatis.

Var. ? *nigritula*, differt capite prothoraceque nigris, antennis palpis pedibus anticis et femoribus posterioribus 4 flavis, elytris pallide testaceis (ut typi nigro-maculatis). Long., $2\frac{4}{5}$ l. ; lat., $1\frac{1}{5}$ l.

The black spots on the elytra are a large common diamond-shaped spot on the middle of the suture, and three on each elytron near the lateral margin (the first on the shoulder round, the next about the middle oval, the last elongate near the apex and touching the lateral margin), successively larger hindward. The var. ? is in the collection of Mr. French ; though coloured so extremely differently from the type, it presents absolutely no other difference that I can discover.

Victoria.

TENEBRIONIDÆ.

ISOSTIRA.

The following species may for the present be attributed to this genus, although it will likely enough be regarded eventually as generically distinct. Mr Pascoe (Ann. Nat. Hist., 1870) characterised *Isotira* very briefly by saying that it agrees with

Hopatrum in the form of its maxillary palpi, its elytra closely fitted to the prothorax and its incomplete elytral epipleurae, but differs in its entire clypeus and transverse non-sinuate labrum. The insect before me (which I have received from Mr. Masters) agrees with this description, and is evidently very near to *Hopatrum*. But in his description of the typical species, Mr. Pascoe says that the eyes are nearly entire; in that respect Mr. Masters' insect differs much, the ocular canthus cutting into the eyes scarcely if at all less deeply than it does in *Hopatrum*.

I. raucipennis, sp. nov. Glabra; nitida; alata; obscure brunnea, corpore subtus pedibus antennisque rufescentibus; capite prothoraceque crebre fortiter granuloso-ruguloso: illo intra oculos utrinque carinato; prothorace quam longiori circiter duplo latiori, antrorsum fere a basi leviter arcuatim angustato, antice valde emarginato in medio late leviter producto, fortiter sat late canaliculato, lateribus fortiter crenulatis, angulis anticis sat acutis posticis subrectis, basi media late lobata; elytris punctulato-sulcatis, interstitiis carinatis seriatim tuberculatis; tibiis sat gracilibus ad apicem summum angustatis: corpore subtus fortiter punctulato (prosterno quam cetera segmenta magis crasse). Long., 3 l.; lat., $1\frac{2}{5}$ l.

Apparently with a good deal of general resemblance to *I. crenata*, Pasc., but differing from it (besides in the shape of the eyes already alluded to) *inter alia* by the puncturation of the head, which is said to be in *crenata* "rather finely and closely punctured on the vertex," the tuberculate elytra, &c. The well-defined rows of tubercles on each elytron are eight in number; between the last of these and the external margin is a space on which the sculpture is somewhat confused, but bears at least one fairly defined row of tubercles.

Queensland.

PLATYPHANES.

P. creber, sp. nov. Oblongus; parallelus; glaber; sat nitidus; niger, elytris æneis, pedibus picescentibus; capite antice distincte punctulato postice et pone oculos subtiliter granulato; prothorace quam longiori duplo (postice quam antice fere quarta parte) latiori, leviter fere obsolete nec crebre punctulato, toto marginato, antice profunde arcuatim emarginato, lateribus leviter sinuato-arcuatis, basi media lobata, angulis anticis fortiter productis nec acutis posticis acutis dentiformibus; elytris conjunctim quam prothorax dimidio latioribus, ad apicem sat anguste rotundatis, minus convexis, singulis striis circiter 14 impressis, striis inæqualiter nec grosse cancellato-punctulatis, latera versus striis nec

puncturis gradatim obsoletescentibus, prope apicem striis puncturisque obsoletis ; antennis prothoracis basin attingentibus, articulis 8-11 moniliformibus ; sternis in parte majori lævigatis ; abdomine confertim subtiliter punctulato ; elytrorum epipleuris integris ; prosterno antice compresso-carinato ; abdominis processu intercoxali antice sat late rotundato. Long., 13 l. ; lat., $5\frac{3}{5}$ l.

This is the largest species yet described of the genus. Of the species approaching it in size *oblongus*, Waterh., and *Godeffroyi*, Haag-R. (which I suspect are identical), are both described as having *ten* rows of punctures on each elytron—this having 14 rows—while *gibbosus*, Westw., is very differently shaped, having the elytra very strongly convex—or rather gibbous—behind the scutellum.

N. Queensland ; in the collection of C. French, Esq.

CHARTOPTERYX.

C. victoriensis, sp. nov. Ovata ; setis nigris erectis vestita ; nitida ; nigro-ænea, elytris cupreo cyaneoque intermixtis micantibus ; capite inæqualiter punctulato, clypeo antice truncato ; prothorace quam longiori fere duplo (postice quam antice dimidio) latiori, in medio sparsissime ad latera crebre sat fortiter punctulato, antice profunde arcuatim emarginato, lateribus leviter sinuato-arcuatis, basi media lobata, angulis anticis fortiter productis sat acutis posticis acutis dentiformibus ; elytris pone scutellum conjunctim gibbosis, quam prothorax plus quam dimidio latioribus, ad apicem anguste rotundatis, confuse inæqualiter nec crebre foveolatis, foveis apicem versus obsoletescentibus, lateribus ante apicem fortiter sinuatis ; antennis prothoracis basin longe superantibus, articulis 9-11 brevibus ; corpore subtus in medio vix perspicue ad latera crebre subtiliter punctulato ; elytrorum epipleuris rugulosis haud plane integris ; prosterno antice compresso-carinato ; abdominis processu intercoxali antice lato rotundato ; tarsorum posticorum articulo basali quam cetera conjuncta manifeste breviori. Long., $7\frac{3}{5}$ l. ; lat., $3\frac{4}{5}$ l.

Somewhat resembling *C. Childreni*, Westw., but *inter alia* without the areolar sculpture of the apical part of the elytra.

Mountains of Victoria ; in the collection of C. French, Esq.

CARDIOTHORAX.

C. æripennis, sp. nov. Mas. Oblongo-ovalis ; niger, elytris sat nitidis subauratis ; capite prothoraceque sparsim subtilissime punctulatis ; illo sat lato antice late rotundato ; prothorace sat transverso, sat fortiter canaliculato et foveolis nonnullis impresso, antice sat fortiter arcuatim emarginato, lateribus

fortiter rotundatis mox ante basin rectis et sat late deplanatis, parte deplanata a disco sulco profundo (hoc postice obsoleto) divisa et antice carina obliqua instructa, basi subangulatim emarginata quam apex parum angustiori, angulis anticis subacutis posticis valde acutis vix extrorsum directis, margine integro; elytris æqualiter profunde sulcatis, supra subplanatis, lateribus sat abrupte declivibus, humeris obtuse angulatis antrorsum sat prominentibus, interstitiis æqualibus fortiter convexis; femoribus inermibus; tibiis anticis modice dilatatis et subtus denticulatis, posticis sat fortiter dilatatis flexuosis, externe concavis. Long., $6\frac{3}{5}$ l.; lat., $2\frac{1}{5}$ l.

Isolated from its congeners by the following characters in combination:—Femora of male unarmed, foliaceous margins of prothorax moderately wide (about the width of one-sixth of the disc), surface nitid, elytra strongly and evenly striated, hind angles of prothorax extremely prominent and acute, hind tibiæ of male strongly compressed and flexuous. It may be remarked that *C. simulans*, Haag-Rutenberg, is founded on a female; and the description, moreover, being a very bad one, omitting nearly all important characters, it is difficult to form a clear idea of what that insect is; but the expression "lang herzförmig" applied to its prothorax certainly does not fit the prothorax of this species, the width of which is just about once and two-thirds the length down the middle line. In Mr. Bates' tabulation of *Cardiothorax* (E.M.M., 1879, pp. 32, &c.) the present insect would stand beside *Castelnaudi* and *grandis*, from both of which the even striation of its elytra distinguishes it. The greatest width of the prothorax is exactly equal to that of the elytra by measurement, but to a casual glance the prothorax appears slightly wider. A strong character, if constant, is the oblique carina running across the foliaceous margins of the prothorax near the front, and cutting off the front angles.

N.S. Wales; Blue Mountains.

DÆDROSIS.

D. monticola, sp. nov. Elongata; sat nitida; capillis paucis hic illic vestita; nigra, tarsis et antennarum apice summo castaneis; capite subfortiter minus crebre punctulato, postice spatio pentagonali impresso, prothorace leviter transverso, crebre subtilius punctulato, postice paullo angustato, lateribus vix perspicue crenulatis; elytris profunde crenato-striatis, interstitiis sat planis, haud transversim rugulosis vix perspicue punctulatis; tibiis posticis rectis, tarsis anticis (? maris solum) fortiter dilatatis. Long., 5 l.; lat., $1\frac{1}{2}$ l. (vix).

Distinguished at once from its previously-described congeners by the very much finer puncturation of its prothorax and the

almost lævigate interstices of its elytra. The long hairs on its surface are very few and far between, and need looking for. The crenulations of the sides of the prothorax are very feeble.

N.S. Wales ; Blue Mountains.

SEIROTRANA.

S. major, sp. nov. Oblongo-ovalis ; sat convexa ; sat nitida ; ænea ; prothorace sat dense longitudinaliter strigoso et fortiter punctulato, antice sat fortiter emarginato, lateribus fortiter rotundatis postice coarctatis ; elytris lineis 4 interruptis elevatis instructis, interstitiis biseriatim fortiter punctulatis et tuberculis parvis nonnullis instructis. Long., 9 l.; lat., 4 l.

Very like *S. catenulata*, Boisd., but much larger, of a bright (almost nitid) brassy colour, decidedly convex in form, with the prothorax less strongly emarginate in front, the surface of the same marked with less closely-placed elevated lines, leaving the puncturation much more conspicuous, and the sides more strongly rounded and less strongly toothed, and the interstices of the elytra with larger punctures in the geminate series with small pustules (not placed in regular order one in front of each puncture but) very sparingly placed at distant intervals. The hind angles of the prothorax are considerably less sharply defined than in *S. catenulata*. The other large species described differ from this insect, *inter alia*, in having the sides of their prothorax entire. The basal four joints of the front tarsi in the example before me are all strongly transverse.

N.S. Wales ; taken near Tamworth by Mr. Musson.

MELOIDÆ.

HOPLOZONITIS (gen. nov.)

A Zoniti differt palpis multo magis robustis ; capite sat brevi ; antennis (? maris solius) prothoracis basin haud multo superantibus femoribus posticis (? maris solius) valde incrassatis, subtus fortiter 4-dentatis et ad tibiarum receptionem sulcatis, tibiis posticis valde compressis et curvatis ; unguiculorum lobo superiori in parte basali sola denticulato, lobo inferiori pergracili subclavato.

The heteromerous tarsi, bifid claws and head divided from the prothorax by a distinct neck, place this genus in the *Meloidæ ;* its elongate metasternum, normal maxillæ, clypeus produced beyond the insertion of the antennæ, elytra reaching the apex of the abdomen, nonclavate antennæ, claws denticulate along the basal part of their superior lobe and oval apical joint of the palpi associate it with *Zonitis*, from which it is at once dis-

tinguished by its hind legs resembling those of a *Haltica* (at any rate in one sex) with two large teeth on either side of the underside of the femora near their apex.

H. mira, sp. nov. Elongata; sat parallela; rufa, antennis palpis femorum apice tibiis tarsisque nigris; capite prothoraceque subtiliter minus sparsim punctulato: hoc quam longiori plus quam dimidio latiori, postice truncato antice emarginato, lateribus sinuatis, disco utrinque (exempli typici) late obscure impresso; elytris obscure sat crebre rugulosis, obsolete 4-costatis, apice late rotundatis. Long., 8 l.; lat., $2\frac{1}{3}$ l.

The elytra are of very thin texture, and have dried (in the typical example) in a more or less distorted condition, but they are as long as the hind body, and are wide enough at the apex to cover the same; probably, however, their normal condition is to be somewhat open.

Queensland; Cape York; in the collection of C. French, Esq.

CURCULIONIDÆ.

MANDALOTUS.

This genus founded by Erichson in 1842, and of which he described no less than four species—all from Tasmania—seems to have been a difficulty to subsequent authors. Schönherr does not appear to have expressed any opinion about it; Lacordaire places it among a group of genera which he thought might appertain to the *Eremnides*, but of which he had never seen a type; Pascoe expresses no opinion, but merely remarks that he has never seen *Mandalotus*.

Starting from the consideration that it is extremely unlikely Erichson had four congeneric species from Tasmania which no one has since seen, I have recently been examining the Tasmanian *Curculionidæ* (of which there are a considerable number) in my collection, to endeavour to identify *Mandalotus*, and I feel no doubt I have succeeded, and that it is identical with the genus which Pascoe has since named *Dysostines*. A *Dysostines* from Tasmania, in my collection, agrees perfectly well with Erichson's generic characters for *Mandalotus*, and is not improbably the species Erichson calls *sterilis*, though on this latter point I feel some doubt. *Dysostines* presents every character that Erichson attributed to *Mandalotus*, and the diagnosis is a very full one, although, as might be expected in a diagnosis published before Schönherr's work, two of the characters of chief classificatory value (viz., the visibility of the maxillæ and the non-contiguity of the front coxæ) are passed over in silence. I think, therefore, that the name *Dysostines* must be treated as a synonym of *Mandalotus*, and that *Mandalotus* must be removed from the

Eremnides, and placed among the *Rhyparosomides*, where Pascoe has placed *Dysostines*.

EREMNINI.

This aggregate of species is distinguished from the *Leptopsini* by M. Lacordaire by only one character that is stated as constant and reliable, viz., that the rostral scrobes are not directed downward. This character, although slight, is one that (at any rate in many *Curculionidæ*) seems to be an important one, *i.e.*, the direction of the scrobes does not seem to vary so much as many other characters do in species that seem to be in reality closely related to each other. It must be confessed, however, that it does not appear to be so satisfactory in its application to the Australian *Eremnini* (at least those known to me) as might be wished, since its application distributes between two subfamilies species that certainly do not seem as if they ought to be so widely separated. Among the *Adelognathi* furnished with ocular lobes in my collection are three species whose scrobes are not directed downward, that is, the lower margin of the scrobe, if continued hindward, would not pass beneath the eye, but would cut it, or at least touch its lower extremity. In one of them the head exactly agrees with the figure of the head of *Pephricus* in Tr. Ent. Soc. Lond., 1870, pl. v., fig. 72; in the other two the scrobe is placed still higher. Apart from the structure of the scrobes these species have decidedly the facies of small *Leptopsini*, but that structure certainly seems to require their being referred to the *Eremnini*.

As regards the genus to which these species should be referred, I think they might, with fair reason, be treated as representing two new genera, as their facies is distinctly of two types and very different from that of the already-named Australian *Eremnini*. But as things stand at present—only a very small proportion of the Australian *Curculionidæ* having been described—it seems to me that new genera should be formed only very reluctantly, and where there is some extremely salient structural character absolutely requiring it, as the examination of a long series of species, in many instances, shows that characters apparently very satisfactory in themselves are nevertheless of little value. As an example of this I may mention the number of claws on the tarsi. Mr. Pascoe has, very naturally, regarded the absence of one of the two claws as a good generic character in the *Eremnini* and *Leptopsini*; nevertheless, I have before me specimens which throw great doubt on its value, presenting in a number of small *Polyphrades*-like species a *gradual* change in this respect, beginning with the evidently *two* soldered claws of a typical *Polyphrades*, then passing to a form in which the two claws are more

closely soldered, and only split apart as mere points at the apex, then to a form in which the hind tarsi or the four posterior tarsi have only one claw while the claws of the front tarsi are distinctly double at their extreme point, and ending with forms in which no duality can be discerned in any of the claws.

Still, as genera have already been formed on the number of claws as their principal character, it will for the present be convenient to regard this as a *generic* character, and as only a single *Eremnid* genus is recorded to have a single claw, I think it will be well to refer to that genus *(Pephricus)* all the Australian *Eremnini* having only a single claw unless they differ from the diagnosis of *Pephricus* in some character really of first-class importance. I take then the following to be the distinctive characters of *Pephricus* as a genus :—Rostrum separated from the head on the underside by a deep transverse sulcus ; antennæ shortish and more or less stout, with a funicle of 7 joints ; scutellum not, or scarcely, apparent ; femora unarmed ; a single claw only to the tarsi ; metasternum very short ; basal two ventral segments sub-equal, *inter se*, the next two much shorter ; hind corbels open. Thus characterised the genus *Pephricus* may receive the following two species :—

PEPHRICUS.

P. umbratus, sp. nov. Obscurus, squamis albidis fuscis et nonnullis nigricantibus indeterminate crebre vestitus : vix manifeste setosus : rostro antrorsum angustato supra sat plano : scrobibus supernis ; oculis ovalibus infra paullo acuminatis ; prothorace quam longiore tertia parte (postice quam antice parum manifeste) latiori, lateribus modice arcuatis ; scutello vix distincto ; elytris quam prothorax tertia parte latioribus, plus quam duplo longioribus basi emarginatis, leviter striatis, striis, sat fortiter punctulatis, lateribus sat rotundatis, latitudine majori paullo pone basin posita. Long., 2—2½ l.; lat., 1—1⅓ l.

This species differs from the two previously described by not being clothed with long setæ. The antennæ are short and stout; set back they would about reach the base of the prothorax ; the scape reaches the back of the eye ; joints 1 and 2 longer than wide, 1 longer than 2, 3—7 transverse, the club short and stout obovate ; the head rostrum and front of prothorax viewed from the side are exactly represented in the figure of *P. echymis*, Pasc. (Tr. Ent. Soc., tab. v., fig. 72.) Viewed from above the rostrum is gradually narrowed forward, its lateral margins forming the upper margins of the scrobes, the whole of which are visible when the rostrum is looked down upon from above. The actual base of the elytra is the same width as the base of the prothorax, but

the elytra are quickly dilated behind the base ; the shoulders are distinctly marked. The legs are more or less reddish, the anterior tibiæ denticulate within. There are no defined markings, the whitish, fawn-colored, and darker scales shading off one into another ; but the paler shades predominating at the sides more or less distinctly. The sculpture of the upper surface (except the punctulate striæ of the elytra) is completely hidden by the scales.

Western Australia ; taken by E. Meyrick, Esq.

P. squalidus, sp. nov. Obscurus ; indumento terreo indutus ; setis brevibus adpressis rufis sparsim vestitus ; rostro sat plano, parte superiori in medio valde constricta ; scrobibus plane supernis fere rotundatis ; oculis subrotundatis ; prothorace quam longiori (et postice quam antice) vix latiori, lateribus sat rotundatis ; scutello haud manifesto ; elytris quam prothorax fere dimidio latioribus paullo plus quam duplo longioribus, basi emarginatis, striatis, striis minus distincte punctulatis, interstitiis postice sat convexis, lateribus modice rotundatis. Long., $1\frac{4}{5}$—$2\frac{1}{2}$ l. ; lat., $\frac{4}{5}$—1 l.

Usually completely covered with an earthy-looking indumentum, which it is almost impossible to remove without removing the underlying scales, but (as far as I can see) the insect without the indumentum is densely clothed with scales of various shades of brown, some of them bright, and almost coppery. The most distinctive character consists in the remarkable sculpture of the rostrum, in which the scrobes look like roundish holes inserted in the upper surface, and separated from each other by a space less than a third part the width of the whole rostrum, as viewed from above. The space between them has a little the appearance of being compressed into a kind of *ridge*, as though the true upper surface of the rostrum were here very narrow ; this quasi-ridge being at its narrowest at the hind end of the scrobes, and its sides diverging from that point forward (at the same time forming the inner edge of the scrobes). The head, rostrum, and front of prothorax, viewed from the side) are almost as in the preceding species ; but the eyes are rounder, and both eyes and scrobes appear much nearer to the upper line of the outline. The antennæ are a little longer and less stout than those of *P. umbratus*, joints 3 to 7 of the funiculus being not quite so wide as long, and the club being considerably longer and less thickened. The inner outline of the front tibiæ is spinulose rather than denticulate.

Two examples taken at no great distance from Adelaide, although smaller than the type (long., $1\frac{3}{4}$ l.), appear to me to belong to this species. They are, however, devoid of the indumentum that is usually present, their surface being clothed with

scales of various brown tints, shaded off into each other. The prothorax is covered with rather coarse flattened tubercles, closely placed, and the elytra are clothed with short curved setæ.

S. Australia; Basin of Lake Eyre.

Longicornes.

TRYPHOCHARIA.

T. Mitchelli, Hope. My note on this sp. (vide supra, p. 56) has elicited from Mr. French, the Victorian Colonial Entomologist, information that satisfies me of my supposed identification of this insect having been founded on a mistake, and that the specimen I regarded as *T. Mitchelli* is in reality an example of an undescribed species—which accordingly I describe as follows:—

T. Frenchi, sp. nov. Valde elongata; fusco-ferruginea, capite prothorace et elytrorum basi piceis, his in parte apicali tertia fuscis in parte intermedia sordide testacea (parte intermedia irregulariter fascia transversa angusta anfracta fusca notata); prothorace quam longiori paullo latiori, fortiter ruguloso, tuberculis 4 et spatio mediano sub-lanceolato instructo, lateribus spina modica acuta vix arcuta armatis, elytris crasse punctulatis (antice profunde, retrorsum gradatim minus profunde), ad apicem oblique truncatis et spinis binis acutis validis armatis; antennarum articulo 3° quam 4^us^ parum (quam 5^us^ haud) longiori, articulis 3° 4° que spina externa armatis. Long., 20 l.; lat., 5 l.

The type is a female, its antennæ not quite reaching the apex of the elytra.

N.S. Wales.

DIDYMOCANTHA.

D. novica, sp. nov. Nitida; minus sparsim pilosa; nigro fusca; scutello griseo-pubescenti; antennarum articulis 3° 5° que (apice excepto) 6^i^ que basi, femoribus ad basin, tibiis in medio, elytrorum humeris summis, prosterno metasterno et abdominis basi, testaceis; prothorace quam longiori vix latiori, sat crasse umbilicato-punctulato, 11-tuberculato; elytris sat fortiter (apicem versus magis subtiliter) sat crebre punctulatis, obsolete bicostatis, apicibus rotundatis; femoribus quam *D. obliquæ*, Newm. paullo brevioribus paullo minus linearibus; antennis (feminæ?) quam corpus paullo brevioribus, articulo 3° quam 4^us^ sat longiori quam 5^us^ vix breviori. Long., 7 l.; lat., 2 l.

This species appears to be very near *D. brevicollis*, Pasc. (from W. Australia), which I know only by description, but it is cer-

tainly, I think, distinct. It seems to be very differently coloured, the W. Australian insect having testaceous elytra with the shoulders and apices darker, whereas in this the elytra are brownish-black, with the shoulders testaceous. In *D. brevicollis* the tubercles on the prothorax are said to be nine (three on the disc and three on each side); in this species there are a transverse row of five tubercles a little in front of the base (the external one on each side being spiniform), a transverse row of four slightly in front of the middle, and a single tubercle on each side just about the middle. The basal four joints of the antennæ are nitid and very coarsely punctulate; the entirely dark colour of the fourth joint is probably not constant. The absence of a depressed pubescence, the colour, and many other characters, distinguish it from *D. obliqua*. The femora, without being at all clavate, are stouter than, and not quite so linear, as those of *D. obliqua*.

Victoria; Mooroolbark Ranges; taken by Mr. French.

D. (Stenocorus) annulicornis, Germ. This species seems to be identical with *D. obliqua*, Newm., of which, in that case, its name will be a synonym.

TEISPES.

T. Frenchi, sp. nov. Mas. Nitidus; piceo-niger; metasterno pedibusque rufis, hoc breviter fulvo-pubescenti, antennis rufo-piceis; mandibulis quam caput parum brevioribus, sparsim inæqualiter punctulatis; capite medio subtiliter canaliculato, antice inæqualiter punctulato (puncturis magnitudine valde diversis), postice opaco granulato; prothorace quam longiori plus quam duplo latiori, antice fortiter trisinuato, disco toto (puncturis magnis sparsis in parte postero-externa exceptis) fere lævi, parte laterali sat late opaca crebre rugulose punctulata, lateribus serratis; elytris obsolete reticulato-rugatis vix perspicue punctulatis ad apicem rotundato-truncatis (angulo suturali breviter spiniformi), vix perspicue 3-costatis, sulco elongato obsoleto prope marginem lateralem instructis; femoribus posterioribus 4 subtus biseriatim denticulatis; tibiis anticis prope apicem dente singulo et ad apicem altero extus armatis; antennis quam corporis dimidum paullo longioribus, scapo oculum medium paullo superanti parum depresso, articulo 3° quam scapus paullo breviori; abdomine fere lævi, segmento apicali postice longe fulvo-ciliato.

Feminæ mandibulis paullo brevioribus, prothorace angustiori. Long. (mands. incl.), 18—21 l.; lat., 6—6½ l.

The prothorax of the male is scarcely, of the female considerably, narrower than the elytra. I have in my collection an example from Port Darwin of an insect which I take to be *T.*

dorsalis, Thoms. (and which, moreover, is very likely to be *Mallodon insulare*, Hope—Hope's name in that case having the priority). Compared with the Port Darwin species the present insect is much more nitid, the basal joint of the antennæ scarcely flattened, the lateral borders of the prothorax very much more strongly and closely punctured, in sharp contrast with the almost perfectly lævigate disc, the elytra nearly lævigate, the abdomen nearly black, &c.

N. Queensland; presented to me by C. French, Esq.

MICROTRAGUS.

M. quadrimaculatus, sp. nov. Setis erectis sparsim vestitus; dense nigro-fusco-squamosus, palpis testaceis, pedibus et maculis in elytris binis (humerali et subapicali) cinereo-squamosis; prothorace quam latiori (spinis lateralibus exclusis) vix longiori, supra subplanato, inæquali, ruguloso, utrinque spina robusta conica armato; elytris quam prothorax (spinis lateralibus inclusis) vix latioribus, tuberculorum conicorum seriebus binis instructis, ad apicem singulatim minute oblique truncatis. Long., $4\frac{1}{2}$—6 l.; lat., $1\frac{4}{5}$—$2\frac{2}{5}$ l.

The disc of the prothorax bears numerous obscure little tubercles, and a larger one on each side of the median line nearer to the front margin than to the base; some of the small tubercles form an obscure raised line across the disc somewhat behind the middle. The elytra are sparsely pitted with large fovea-like punctures. The nearly-black colour with a large ashy-white spot on each shoulder, and another near the apex of each elytron (the latter ill-defined,—the whole apex being slightly cinereous) renders this a very distinct species.

N. Queensland; sent to me by C. French, Esq.

PENTHEA.

P. pardalis, Newm. I have recently seen in the collection of C. French, Esq., a specimen taken in N.W. Australia which appears to be a small and rather obscurely-coloured example of this insect. I believe its occurrence in Western Australia has not been previously recorded.

PHYTOPHAGA.

DONACIA.

D. Australasiæ, sp. nov. Testacea, prothorace obscuriori, hoc elytrisque viridimicantibus; corpore subtus confertim breviter albido-argenteo-pubescenti; antennis gracilibus quam corpus paullo brevioribus; femoribus haud dentatis;

elytris punctulato-striatis, ad apicem truncatis. Long., 4 l.; lat., $1\frac{1}{5}$ l.

This species appears to be a true *Donacia*, the insertion of the antennæ, the almost contiguous strongly exserted front coxæ, the form of the prothorax, and I think all other structural characters being quite as in that genus. It is an insect of a pale, washed-out, testaceous-brown colour, with a bright greenish gloss in certain lights. The head and prothorax are almost devoid of puncturation, and are semi-opaque, owing to being minutely coriaceous. The prothorax is a little rugulose near the base, all its angles well defined and laterally prominent. The antennæ and legs are of a brighter testaceous colour than the general surface, each joint of the former a little darker at the apex.

Queensland; sent to me by G. Masters, Esq.

RHYPARIDA.

R. Mastersi, sp. nov. Flavo-fulva, mandibulis antennis (articulis basalibus 4 exceptis) genubus et elytrorum fasciis latis 2 (altera basali altera apicali) nigris, his in margine laterali anguste connexis, tibiis tarsis mesosterno metasternoque obscurioribus; clypeo profunde emarginato (angulis anticis productis) fortiter sat crebre punctulato; fronte impunctata puncturis paucis antice positis exceptis) in medio antice longitudinaliter breviter foveolata; prothorace lævi, lateribus rotundatis; elytris seriatim sat fortiter punctulatis puncturis apicem versus subobsoletis; femoribus muticis. Long., $2\frac{4}{5}$ l.; lat., $1\frac{1}{4}$ l.

This species does not approach any yet described in colouring —and it is certainly not a variety of any of a fairly long series of species in my collection. Nevertheless the species of this genus are so subject to variation in markings that it is not improbable a good many now called species may eventually be found to be varieties. I cannot, however, suggest any species of which this may be a variety, and in any case it is convenient that well-marked varieties should have a distinctive name. In the present insect the dark fasciæ are so wide as to occupy the greater part of the elytra, the fulvous colouring appearing as a fascia, occupying about the middle one-third of the elytra, its front margin commencing on each elytron a little behind the scutellum on the suture and running obliquely hindward to the lateral margin (which it does not quite touch) at about a third of its length; the *hind* margin of the fulvous part of the elytra commencing on the suture a little behind its middle and running obliquely towards (but not quite touching) the lateral margin at about two thirds of its length from the base.

Queensland; sent to me by Mr. Masters.

STETHOMELA.

S. caudata, sp. nov. Late ovalis, valde convexa; nitida; nigro-viridis capite prothorace antennarum basi elytrorum apice summo abdomineque (segmento basali excepto) rufis; capite fortiter sat crebre (vertice lævigato excepto), prothorace acervatim sat fortiter, punctulatis; elytris seriatim punctulatis (punctures retrorsum gradatim magis subtilibus), pone humeros profunde impressis; prosterno medio triangulariter planato, parte planata carina subtili marginata; unguiculis appendiculatis. Long., 3 l.; lat., 2 l.

An extremely distinct species. The structure of the prosternum bears a remarkable resemblance to that of some species of *Rhizobius*.

Queensland; sent to me by Mr. Masters.

PAROPSIS.

P. rufopicta, sp. nov. Breviter ovata; minus convexa; sat nitida; nigra, antennis palpis tarsisque rufescentibus, prothorace ante medium maculis 2 approximatis elytris maculis 3 (basali prope scutellum oblongo, mediana transversa oblique posita, subapicali irregulari) rufis ornatis; supra tripliciter punctulata (punctures subtilibus et aliis sat fortibus intermixtis undique, punctures magis crassis latera versus, positis), punctures magnitudine intermedia in elytris irregulariter undatim seriatis; prothorace quam longiori plus quam duplo (postice quam antice paullo plus quam tertia parte) latiori, antice fortiter bisinuatim emarginato, lateribus leviter arcuatis, angulis anticis productis minus acutis posticis rotundatis; sternis fere lævigatis; abdomine sparsim fortiter punctulato. Long., $2\frac{1}{4}$ l.; lat., 2 l. (vix).

The seriate puncturation of the elytra is much confused, but seems to consist of about ten fairly continuous lines, and about as many more mixed among them, which are wavy and scarcely continuously traceable. This sculpture would place the present species in Dr. Chapuis' "Group IV." of the genus. The coarsest of the punctures are scattered about the front and sides of the head (which is very wide), and form a confused stripe along either side of the prothorax and elytra. The elytra at the base are considerably wider than the base of the prothorax; their shoulders are much rounded.

W. Australia; sent to me by G. Masters, Esq.

AULACOPHORA,

A. occipitalis, Baly. I have an example taken near Port Darwin, which is quite identical with specimens of this species from New Guinea.

RUPILIA.

R. rugulosa, sp. nov. Ovata ; subopaca, subtus magis nitida ; nigro-piceo, capite antice prothorace sternis et segmento ventrali apicali rufescentibus ; supra sat equaliter rugulose punctulatus ; prothorace quam longiori fere duplo (postice quam antice haud multo) latiori, latitudine majori ante medium posita, lateribus subangulatim rotundatis, marginibus anticis et posticis late leviter concavo, utrinque basin versus sulco obliquo impresso. Long., 4 l.; lat., $2\frac{1}{2}$ l.

N. Queensland ; sent to me by Mr. Masters.

COCCINELLIDÆ.

EGLEIS.

E. varicolor. Muls. From the description of *Coccinella Kingi*, Macl., it has appeared to me that *E. varicolor* is identical with it, and Mr. Masters has now done me the favour of comparing an example with the original type of Macleay's insect, with the result of proving my conjecture right. *E. varicolor*, therefore, becomes a synonym of *C. Kingi*.

NEDA.

N. bicolor, sp. nov. Late ovata ; valde convexa ; nitida ; supra modice vix crebre punctulata ; capite antennis palpis corpore subtus pedibusque rufo-testaceis, prothorace (hujus angulis anticis anguste flavis) nigris. Long., $2\frac{1}{2}$ l.; lat., $2\ \frac{2}{5}$ l.

This species is a *Neda* in Mulsant's sense of the term. I am unable to discriminate the briefly-characterised sections into which Mr. Crotch divided it, but as I can find no structural character to separate it from *N. princeps*, Muls., I presume that author would have placed it in *Archaioneda*. Apart from its entirely different colouring it is very like *N. princeps* in miniature, having an exactly similar outline (which is very peculiar) when viewed from the side. The prothorax, however, is much more strongly transverse than that of *N. princeps*, and is somewhat wider in proportion to the elytra. Superficially not unlike *Synia melanaria*, Muls., but differs in the form of the clypeus and other structural characters. The flanks of the prosternum are not foveated.

N. Queensland ; sent to me by Mr. Masters.

CŒLOPHORA.

C. Mastersi, sp. nov. Late ovalis ; subcircularis ; distincte sat crebre punctulata ; nigra, capite antennis palpis prothoracis lateribus (late) margine antico et linea mediana angusta prosterno epipleuris (his externe nigris) pedibus et abdominis

lateribus rufo-testaceis, elytris ad apicem anguste rufescentibus. Long., $2\frac{1}{5}$ l.; lat., 1 $\frac{4}{5}$ l.

This species also bears a superficial resemblance to *Syuia melanaria*, but has the clypeus of a *Calophora*. It is not unlike *C. Jansoni*, Crotch, but is smaller, with the prothorax and underside marked with black, and the tips of the elytra only very narrowly reddened; its puncturation, moreover, is considerably less strong. It is also near *C. vidua*, Muls., from Java, but is a little smaller, with the median line of the prothorax red, the elytra tipped with red, the abdomen (except at the sides) black, &c.

N. Queensland; sent to me by Mr. Masters.

C. guttata, spec nov. Subcircularis; sat convexa; sat crebre minus subtiliter punctulata; nigra, prothorace (parte mediana tertia excepta) pallide flavo, capite antennis palpis et pedibus anterioribus 4 rufo-testaceis, elytris maculis binis magnis sanguineis (altera antemediana transversa, altera subapicali ovali paullo minori) ornatis. Long., $1\frac{7}{10}$ l.; lat., $1\frac{3}{5}$ l.

A very distinct species. I do not think any very near it has been described.

N. Queensland; sent by Mr. Masters.

CHILOCORUS.

C. flavidus, sp. nov. Hemisphæricus; minus sabtiliter sat crebre punctulatus, puncturis magnis seriebus binis in elytris latera versus irregulariter positis; callo humerali valde prominenti; flavus, elytris macula communi elongato-triangulari in sutura alteraque transversa postmediana nigris, his maculis in sutura confluentibus. Long., $2\frac{1}{5}$ l.; lat., 2 l.

The puncturation is very similar to that of *C. renipustulatus*, Scriba. The sides of the prothorax are not pubescent. The black markings on the elytra consist of an elongate triangle, with its base occupying about the middle quarter of the base of the elytra, and its apex on the suture considerably behind the middle, and a post median fascia touching the margin on both sides, and of very irregular shape, with its hindmargin produced on the suture nearly to the apex. The two black marks meet on the suture. The spine on the tibiæ is very strongly developed.

N. Queensland; sent by Mr. Masters.

ORCUS.

This genus might easily be subdivided on structural characters of considerable importance. The species differ in the form of the clypeus to an extent that seems inconsistent with the importance attributed to that character in founding the sub-family *Chilocorites* upon it. In *O. bilunulatus*, Boisd., the clypeus is

extremely strongly dilated laterally, forming a wide lamina in front of the eyes, and entirely concealing the base of the antennæ, which lamina becomes successively feebler in *Australasiæ cyanocephalus cœlestis*, until in *chalybeus* it is reduced to a mere fine carina. Mulsant has already called attention to the presence in some species, and absence in others, of a fovea on the sides of the prosternum. The elytral epipleuræ also vary, being fovealated more or less strongly in *bilunulatus Australasiæ* and *cyanocephalus*, but not (or at least not distinctly) in the others known to me of the genus. I may say that I have not seen *O. quadrimaculatus*, De Kerville. The following species appear to be new.

O. punctulatus, sp. nov. Hemisphæricus ; minus convexus ; crebre sat subtiliter punctulatus ; supra cyaneus, prothorace antice et ad latera ante medium anguste rufomarginato, antennis labro palpis pedibus et corpore subtus (prosterno epipleurisque nigris exceptis) testaceis ; prothorace ad latera quam in disco magis fortiter punctulato sed nullo modo ruguloso ; elytris ad latera sat late sat æqualiter deplanatis ; clypeo ad latera sat fortiter (fere ut *O. cyanocephali*, Muls.) laminato ; prosterni lateribus et epipleuris foveolatis. Long., $2\frac{1}{2}$ l. ; lat., $2\frac{1}{2}$ l.

Colored almost as *O. cyanocephalus*. It is allied to that species, but is larger, more evenly rounded on the sides (not at all ovate) and not so strongly convex ; the puncturation is finer and much closer throughout, the prothorax is not rugulose at the sides, and the explanate border of the prothorax is considerably wider ; the basal line of the prothorax is (as in that species) distinctly separate from the hindmargin. I have no doubt of my identification of *cyanocephalus*, as my type is from Port Darwin (near the original locality), and agrees well with the description.

N. Queensland ; sent by Mr. Masters.

O. splendens, sp. nov. Subhemisphæricus ; minus convexus ; sat crebre minus subtiliter punctulatus : supra læte purpureus, subtus cum antennis palpis pedibus epipleurisque testaceus ; prothorace ad latera quam in disco magis fortiter punctulato sed nullo modo ruguloso ; elytris ad latera anguste deplanatis ; clypeo ad latera fortiter laminato : nec prosterni lateribus nec epipleuris foveolatis. Long., $1\frac{1}{2}$ l. ; lat., $1\frac{3}{10}$ l.

Easily distinguishable by its small size and bright purple colour, the underside being entirely testaceous, as well as by the strong lateral dilatation of the clypeus in conjunction with the absence of foveæ on the sides of the prosternum and on the epipleuræ. The basal line of the prothorax is scarcely separated from the hindmargin.

N. Queensland ; sent by Mr. Masters.

O. ovalis, sp. nov. Late ovalis; sat convexus; subtiliter sat crebre punctulatus; supra splendide viridis, subtus cum pedibus (tarsis abdomineque rufescentibus exceptis) niger, antennis palpisque rufis; prothorace sat æqualiter punctulato; elytris ad latera anguste deplanatis; clypeo ad latera fortiter laminato; nec prosterni lateribus nec epipleuris foveolatis. Long., 1 $\frac{4}{5}$ l; lat., 2$\frac{2}{5}$ l.

Var. supra cyaneus.

A very distinct species, well characterised by its brilliant metallic upper surface and black under surface (except the reddish abdomen) and legs (except the tarsi), It is a little more elongate than its congeners, and is also remarkable for the sides of its prothorax being punctured very little more strongly than the disc. The basal line of the prothorax is distinct from, but very near to, the hind margin.

N. Queensland; sent by Mr. Masters.

O. Australasiæ, Boisd., var.? *obscurus*. Differt statura multo minore, colore nigro (maculis minoribus obscure ferrugineis). Long., 1$\frac{1}{2}$ l.; lat., 1$\frac{2}{5}$ l. (vix).

I have seen several examples of this insect, all from Yilgarn, W. Australia, and all quite identical—and can hardly persuade myself that they are a mere variety, although I cannot find any difference from the type except in respect of size, colour, and markings. The spots on the elytra are placed as in *Australasiæ*, but are quite small, and of a very dark ferruginous tint, so as to be very inconspicuous.

W. Australia; sent by C. French, Esq.

GYMNOSCYMNUS, gen. nov. *Coccinellidarum*.

Corpus fere glabrum, prothorace setis brevibus minus conspicuis sat sparsim vestito; oculi minus subtiliter granulati fere paralleli; clypeus antice truncatus; antennæ ad basin apertæ, quam *Scymni* paulo longiores, *11-articulatæ; prosternum breve in medio sat æqualiter convexum; lamellæ abdominales segmenti basalis apicem attingentes, hujus cum margine postice confusæ; elytrorum epipleuræ subhorizontales integræ, haud foveolatæ; unguiculi appendiculati; sutura ventrali inter segmenta basale et secundum sat fortiter impressa.

The minute species for which I propose this new generic name is scarcely pubescent; the elytra appear to be absolutely glabrous,

* I have not been able to break off an antenna for microscopic examination, as I possess only a single example, but I feel satisfied that there are 11 joints in the antennæ; I can count 10 very distinctly, and am nearly certain there is another that would be distinct under a microscope.

but the head and prothorax are set somewhat sparsely with short crisp silvery hairs; its epipleuræ entire and horizontal furnish a very distinctive character, they are almost exactly like those of *Epilachna*. This genus is not very near to any other known to me; in Dr. Chapuis' arrangement of the *Coccinellidæ* its place is in the group *Scymnites*. In my tabulation of the Australian *Coccinellidæ* (Tr. Roy. Soc., S.A., XI., pp. 186-7) it falls beside the species that I have called "Eupalea?" from which it differs by its incomplete abdominal lamellæ.

G. quadrimaculatus, sp. nov. Fere circularis; nitidus; niger, elytris maculis binis magnis rufis ornatis, nonnullorum exemplorum (?marium) capite prothoracis lateribus femoribusque anticis plus minusve testaceis; supra crebrius subtiliter (latera versus magis fortiter) punctulatus; prothorace fortiter transverso, hujus basi quam elytrorum basis vix angustiori; corpore subtus sublævi. Long., $\frac{4}{5}$ l.; lat., $\frac{4}{5}$ l. (vix).

SCYMNOMORPHA, gen. nov.

Corpus pubescens; oculi subtiliter granulati sat paralleli; clypeus antice truncatus; antennæ ad basin apertæ breves 11-articulatæ; prosternum sat elongatum, antice transversim æqualiter sat fortiter convexum haud carinatum; scutellum modicum; lamellæ abdominales integræ, antice extus longe intra marginem lateralem terminatæ, postice segmenti basalis ventralis apicem nullo modo attingentes; elytrorum epipleuræ horizontales longe ante apicem terminatæ, haud foveolatæ; femora haud in sulcos recepta; unguiculi appendiculati.

This genus is certainly near *Scymnus* (Mulsant's subgenus *Pullus*), but the prosternum wide in front, and evenly convex without any depression or carinæ, seems to justify its separation. The first ventral suture is well defined, and scarcely less strongly impressed than the others. The facies is that of an elongate *Scymnus*.

S. duplopunctulata, sp. nov. Sat elongato-ovalis; albido-pubescens; convexa; nigra, corpore subtus rufescenti, antennis pedibusque rufis; capite prothoraceque crebre subtilissime elytris dupliciter (crebre subtiliter et fortiter sparsim) punctulatis. Long., $1\frac{3}{5}$ l.; lat., 1 l.

Victoria; Alpine District.

SCYMNODES.

S. Koebeli, Blackb. Among the *Coccinellidæ* recently sent to me by Mr. Koebele are a number of examples of *Scymnodes*, which I think must be referred to this species, although in that

case they prove it to be one of the most variable of its family. Among them there are hardly two to be found strictly identical in colouring or sculpture. The greater part of them appear from the labels to have been taken at one place (Toowoomba) and on one plant *(Eugenia)*. As most of them would be quite unrecognisable by comparison with my description of the type form, I think it will be best to describe them as being probably varieties of *S. Koebeli*, as follows :—

Var. ? *immaculatus* a, *S. Koebeli*, differt elytris immaculatis.

Var. ? *Eugeniæ* a, *S. immaculato*, differt pedibus (tarsis exceptis) totis capiteque nigris.

Var. ? *fulvohirtus* a *S. immaculato*, differt pedibus totis capiteque nigris, corpore supra fulvo- (nec cinereo-) hirsuto.

var. ? *varipes* a *S. immaculato*, differt tibiis (præsertim anticis) plus minusve rufescentibus, elytris obsolete punctulatis magis nitidis (nonnullorum exemplorum corpore supra fulvo-hirsuto).

An example differing from the typical form only in the somewhat stronger sculpture of its elytra and under surface and its more darkly coloured head and legs I take to be a typical female. A remarkable character in *S. Koebeli* is the exceptionally strong dilatation of the elytra immediately behind the base, which causes the lateral margin to be very strongly sinuate about the middle.

SCYMNUS.

S. Sydneyensis, sp. nov. Ovalis ; pubescens ; sat convexus ; sat nitidus ; coriaceus, vix distincte punctulatus ; niger, capite prothoraceque (?maris solum) rufescentibus vel testaceis, hoc in medio (præsertim postice) infuscato, elytris maculis rufis ornatis (sc. macula basali magna juxta scutellum, macula parva pone humerum, et fascia pone medium nec marginem lateralem nec suturam attingenti), abdomine postice (?maris solum) rufescenti, pedibus rufescentibus vel testaceis ; prosterno medio longitudinaliter depresso, spatio depresso lato sat parallelo utrinque leviter longitudinaliter carinato ; lamellis abdominalibus haud integris. Long., 1 l. ; lat., $\frac{3}{5}$ l.

N.S. Wales ; taken by Mr. Koebele near Sydney.

S. Australasiæ, sp. nov. Breviter ovalis ; pubescens ; minus convexus ; modice nitidus ; coriaceus, vix distincte punctulatus ; rufo-testaceus, capite prothoracis parte media et elytrorum maculis nonnullis (sc. macula communi triangulari basali et binis minoribus discoidalibus posterioribus) piceis ; prosterno medio longitudinaliter depresso, spatio depresso lato sat parallelo utrinque leviter longitudinaliter

carinato; lamellis abdominalibus haud integris. Long., $\frac{9}{10}$ l.; lat., $\frac{7}{10}$ l.

Among the *Coccinellidæ* taken by Mr. Koebele are specimens from various localities in Queensland, N.S. Wales, and Victoria which agree in presenting the structural characters of the example here described, and are all distinguished by their very fine (scarcely distinct) puncturation, and by being of a rufo-testaceous colour with a more or less distinct infuscate triangular spot, with its base on the base of the elytra, and its apex on the suture at about one-third of the length of the same from the scutellum. In some of these the head is infuscated, and in some the middle part of the prothorax is more or less stained with black; some have also two small infuscate spots placed longitudinally on the hinder part of the disc of each elytron. I think, though not without hesitation, that they all belong to one variable species. I have, however, selected a well-marked example from Queensland for description, and consider it possible that some of the specimens I treat as varieties may yet prove to be distinct species. The insect is very near *S. insidiosus*, Blackb., from S.W. Australia, but is certainly, I think, distinct by its more needle-point puncturation, which is less closely placed on the elytra.

Queensland, &c.

S. jocosus, sp. nov. Ovalis; pubescens; modice convexus; minus nitidus; coriaceus, vix distincte punctulatus; niger vel piceo-niger, corpore subtus plus minusve rufescenti, antennis palpis tibiis anticis tarsis omnibus et elytris postice rufo-testaceis, his maculis binis magnis transversis (altera antemediana lata altera postmediana sat angusta) lætе flavis ornatis; posterno medio longitudinaliter depresso, spatio depresso minus angusto antrorsum a basi leviter angustato utrinque leviter carinato; lamellis abdominalibus haud integris; prothoracis basi media sublobata, lobo postice truncato. Long., 1 l.; lat., $\frac{4}{5}$ l. (vix).

Easily recognisable by the markings on the elytra, which seem constant. They consist of two large bright-yellow transverse spots on each elytron, which nearly (but not quite) touch both suture and lateral margin. The front one extends from a little behind the base to about one-third the length of the elytron, and is produced forward in the middle of its front margin. The hind one is not much more than half as wide as the other, and is situated a little in front of the apex; it is of flexuous form.

Queensland; taken by Mr. Koebele near Toowoomba on *Eugenia*.

S. cucullifer, sp. nov. Ovalis; pubescens; modice convexus;

minus nitidus ; coriaceus, vix distincte punctulatus ; pallide testaceus, metasterno abdomineque rufescentibus, elytris nigris utrinque macula magna arcuata longitudinaliter posita pallide testacea ornatis, elytrorum colore nigro in prothorace producto cucullum simulanti (nonnullis exemplis maculis in elytris divisis vel minoribus vel carentibus, nonnullis exemplis corpore subtus infuscato) ; prosterno medio longitudinaliter depresso, spatio depresso lato sat parallelo utrinque leviter longitudinaliter carinato ; lamellis abdominalibus haud integris. Long., 1 l.; lat., $\frac{7}{10}$ l.

In the example described there is a somewhat kidney-shaped whitish-testaceous mark on each elytron, its convex side directed outward, its lobes nearly reaching the suture, its front a little in front of the middle of the length of the elytra, its hind extremity not very far from the apex of the elytra ; in another example only the two lobes of this mark are present, as two isolated spots on each elytron, in another it is altogether wanting, and the elytra are uniformly black ; all the examples have the prothorax of a very pale testaceous colour, with a large black mark projecting forward over more than half the length and width, like a hood thrown forward from the black elytra over the prothorax ; in one of them, however, the black colouring becomes a little pitchy or brownish in the front of the elytra and on the prothorax.

N. S. Wales (Richmond River) and Queensland; taken by Mr. Koebele.

S. victoriensis, sp. nov. Sat elongato-ovalis ; albido-pubescens ; sat convexus ; niger, capite prothorace (macula magna basali mediana nigra excepta) elytrorum (nonnullis exemplis) apice summo prosterni lateribus abdominis lateribus et apice antennis palpis pedibusque rufis ; capite prothoraceque crebre subtiliter, elytris minus subtiliter vix crebre, punctulatis ; prosterno medio longitudinaliter minus depresso, spatio mediano minus lato sat parallelo haud ad marginem anticum continuato utrinque subtiliter longitudinaliter carinato ; lamellis abdominalibus haud integris. Long., $1\frac{1}{2}$ l.; lat., 1 l.

The elongate form of this species associates it with *S. aurugineus*, Blackb., to which, however, it bears no other resemblance.

Victoria ; Alpine district.

S. subelongatulus, sp. nov. Sat elongato-ovalis; albido-pubescens ; convexus ; niger, prothoracis margine antico summo elytrorum apice, abdomine antennis tibiis tarsisque rufis ; capite prothoraceque subtilissime vix manifeste, elytris paullo magis fortiter nec crebre punctulatis ; prosterno medio

longitudinaliter depresso, spatio depresso lato sat parallelo haud ad marginem anticum continuato, utrinque longitudinaliter carinato ; lamellis abdominalibus haud integris. Long., $1\frac{2}{5}$ l.; lat., $\frac{4}{5}$ l.

Much like the preceding in size and shape, but very differently coloured and punctured.

Victoria ; Alpine district.

S. sublatus, sp. nov. Late ovalis ; albido-pubescens ; sat convexus ; rufo-testaceus, elytris piceis ; capite prothoraceque vix manifeste elytris subtiliter crebre punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso sat lato sat parallelo haud ad marginem anticum continuato utrinque subtiliter carinato ; lamellis abdominalibus haud integris. Long., $\frac{4}{5}$ l.; lat., $\frac{7}{10}$ l. (vix).

Very distinct from its previously described congeners by its short broad form (suggestive of *Ditropidus*) and its colouring.

N.S. Wales ; Blue Mountains.

S. pretiosus, sp. nov. Sat late ovalis ; albido-pubescens ; sat convexus ; colore variegatus, capite prothorace (hoc postice in medio infuscato) et pedibus (femorum posteriorum tibiarumque apice et tarsis, infuscatis) flavis, elytris metasternoque nigris, abdomine rufescenti ; capite prothoraceque crebre subtiliter, elytris sat sparsim sat fortiter, punctulatis ; prosterno medio longitudinaliter minus depresso, spatio mediano sat lato sat parellelo utrinque subtiliter longitudinaliter carinato ; lamellis abdominalibus haud integris. Long., $\frac{7}{10}$ l.; lat., $\frac{1}{2}$ l.

A very pretty species ; bears a certain resemblance to the preceding, but differs in its dark metasternum and hind body, and in the colour of some other parts, as well as in the much more strong and sparse puncturation of its elytra.

Victoria ; Alpine district.

S. aspersus, Blackb. The examination of more examples of *S. insidiosus*, Blackb., suggests the possibility that *S. aspersus* may be an extreme variety of it. I have not, however, seen any specimen of *insidiosus* that is not of distinctly shorter and wider form than *S. aspersus*.

S. inaffectatus, sp. nov. Sat late ovalis ; albido-pubescens ? (exemplo typico fere abraso) ; sat convexus : capite prothorace (hoc macula magna basali fere semi-circulari nigra ornato) pedibusque rufo-testaceis, elytris rufis (horum sutura picea) corpore subtus (prosterno elytrorumque epipleuris pallidis exceptis) fere nigro ; capite prothoraceque subtilissime, elytris magis fortiter, punctulatis ; prosterno medio longi-

tudinaliter depresso, spatio depresso minus lato sat parallelo utrinque longitudinaliter carinato, lamellis abdominalibus haud integris. Long., 1 l. ; $\frac{7}{10}$ l.

This species, in its colour and markings, is more or less like *S. insidiosus* and *Australasiæ*, but at once distinguished from them by the considerably stronger puncturation of its elytra, which associates it with *S. Whittonensis*, a very differently coloured species, with bright fulvous (instead of ashy-white) pubescence.

Victoria ; Alpine district.

S. Whittonensis, sp. nov. Breviter ovalis ; læte aureo-vel fulvo-pubescens ; modice convexus; minus nitidus ; crebre sat distincte punctulatus ; piceo-niger, capite prothoracis margine antico lateribusque prosterni lateribus pedibus anticis femoribus intermediis et tarsis omnibus rufo-testaceis ; prosterno medio longitudinaliter depresso, spatio depresso lato sat parallelo utrinque leviter longitudinaliter carinato ; lamellis abdominalibus haud integris. Long., 1 l.; lat., $\frac{9}{10}$l.

This species resembles *S. tenebricosus*, Bohem., in puncturation, but is very differently coloured, its pubescence particularly being of a bright fulvous colour. The limit of the dark part of the prothorax consists of a curved line commencing on the lateral margins a little in front of the base, and nearly touching the anterior margin at its middle.

N.S. Wales ; taken by Mr. Koebele near Whitton.

S. (?an gen. nov.) *queenslandicus*, sp. nov. Oblongus ; albido-pubescens ; minus convexus ; minus nitidus; obcure brunneus, antennis pedibusque dilutioribus, epipleuris testaceis; capite prothoraceque crebre subtiliter, elytris et corpore subtus fortiter minus crebre, punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso minus lato sat parallelo utrinque leviter longitudinaliter carinato ; lamellis abdominalibus haud integris ; suturis ventralibus æqualiter sat profunde impressis. Long., $\frac{4}{5}$ l. ; lat., $\frac{1}{2}$ l. (vix).

This minute insect is probably not a true *Scymnus ;* the only definite character, however that I can find to distinguish it consists in the first ventral suture not being enfeebled in the middle; the comparatively narrow elongate flattish form gives it a facies unlike *Scymnus*. Nevertheless, as I have not an example for dissection, and so cannot satisfactorily investigate its characters, it is better to place it provisionally in *Scymnus*, from which I do not think it could be far removed structurally.

An example occurs among Mr. Koebele's *Scymnidæ* which is a little less elongate, less parallel, and more convex (being, therefore, more *Scymnus*-like in form) ; it possibly represents a closely allied distinct species ; the flattened space on its prosternum (as

might be expected from the general form) seems distinctly wider than in the specimen described, but as I can find no other difference I think the variation of form is probably sexual.

Queensland; taken by Mr. Koebele.

S. vagans, sp. nov. Late ovalis; pubescens; modice convexus; minus nitidus; niger, vel nigro-piceus, antennis palpis pedibusque læte testaceis; prothorace subtiliter sat crebre, elytris sat fortiter minus crebre, punctulatis; prosterno medio angusto planato; lamellis abdominalibus integris. long., $\frac{1}{2}$ l.; lat., $\frac{1}{3}$ l.

This minute species seems to be a typical *Scymnus* in all respects except in having its abdominal lamellæ entire (I have not, however, succeeded in counting the joints in its antennæ). It is at once distinguished from its Australian described congeners by its extremely small size.

Victoria and N.S. Wales; taken by Mr. Koebele.

The following tabulation of the hitherto described Australian *Scymni* will probably aid in the identification of the foregoing new species.

A. Abdominal lamellæ incomplete.
B. First ventral suture enfeebled in the middle.
C. Pubescence short and fairly close.
D. Prosternum not simple.
E. Puncturation of elytra more or less fine and close (not less so, *e.g.*, than in *S. discoideus*, Ill.).
F. Prosternal ridge entire.
G. Form more or less widely oval.
H. Puncturation of elytra excessively fine (scarcely visible), especially near suture.
I. Elytra blackish, without sharply defined pale markings (prothorax without sharply defined markings).
J. Suture finely carinate behind middle ... simplex, Blackb.
JJ. Suture not at all carinate behind middle ... lubricus, Blackb.
II. Elytra not as I (or prothorax with sharply defined markings).
J. Base of prothorax not with an emarginate lobe.
K. Elytra blackish, at least on a large space around the scutellum.

L. Puncturation of elytra sparse and scarcely visible ... ... Australasiæ, Blackb.
LL. Puncturation of elytra less fine and sparse
M. Form very short and wide ... ... insidiosus, Blackb.
MM. Form less short and wide.
N. Elytra with large conspicuous yellow markings ... jocosus, Blackb.
NN. Elytra not bearing large conspicuous yellow markings ... ... aspersus, Blackb.
KK. Elyt. (except suture and some small markings) pale testaceous brown ... ... australis, Blackb.
JJ. Base of proth. with an emarginate lobe.
K. Markings of elytra yellow ... ... cucullifer, Blackb.
KK. Markings of elytra red ... ... sydneyensis, Blackb.
HH. Puncturation of elytra much better defined (not much less strong than in *S. capitatus*, Fab.).
I. Elytra evenly punctured, or nearly so.
J. Large species (exceeding 1 l. in length) with the elytra red, at least in hinder part.
K. Prothorax almost lævigate ... ... poonindiensis, Blackb.
KK. Prothorax punctured almost uniformly with the elytra ... Meyricki, Blackb.
JJ. Small species (at most 1 l. in length).
K. Pubescence silvery whitish.
L. Head front of pro-

thorax and front legs in male pale yellow — flavifrons, Blackb.
LL. Not colored as L ... — tenebricosus, Boh.
KK. Pubescence fulvous
L. Hind legs black ... — Whittonensis, Blackb.
LL. All the legs rufo-testaceous ... — inaffectatus, Blackb.
II. Elytra almost lævigate towards the lateral margins ... ... — casuarinæ, Blackb.
GG. Form very elongate ... — aurugineus, Blackb.
FF. Prosternal ridge not extending to front margin of prosternum.
G. Elytra not marked with a sharply defined sanguineous pattern.
H. Head and prothorax not entirely bright rufous.
I. Head black.
J. Size large, sides nearly parallel ... ... — subelongatulus, Blackb.
JJ. Size small, sides arcuate — oscillans, Blackb.
II. Head red ... ... — victoriensis, Blackb.
HH. Head and prothorax entirely bright rufous — sublatus, Blackb.
GG. Elytra marked with a sharply defined sanguineous pattern ... — Sedani, Blackb.
EE. Puncturation of elytra much more strong and sparse ... — pretiosus, Blackb.
DD. Prosternum quite simple ... — inusitatus, Blackb.
CC. Pubescence long and sparse ... — notescens, Blackb.
BB. First ventral suture normal ... — queenslandicus, Blackb.
AA. Abdominal lamellæ complete.
B. Elytra with defined markings ... — parallelus, Blackb.
BB. Elytra devoid of markings ... — vagans, Blackb.

HYPOCYREMA, gen. nov. *(Coccinellidarum).*

Corpus pubescens; oculi subtiliter granulati; clypeus antice late truncato-emarginatus subreflexus ad latera late dilatatus antennarum basi omnino obtegens; prosternum latum sat æqualiter convexum; scutellum parvum; lamellæ abdominales magnæ integræ, segmenti basalis apicem attingentes; elytrorum epipleuræ sat latæ, ad femora recipienda foveolatæ; femora in sulcos recepta; suturæ ventrales bene impressæ; tibiis in femorum sulcos receptæ.

The species on which I found this genus has much general resemblance to *Cyrema nigellum*, Blackb., but its clypeus being dilated widely (quite as much so as in any *Orcus* or *Chilocorus*) on the sides in front of the eyes seems to forbid placing it in *Cyrema*. It may be distinguished from *Serangium* (which has a somewhat similar clypeal structure) by its finely-granulated eyes and from *Lipernes* by the under-surface of its body being deeply sulcate for the reception of the legs.

H. pauxillum, sp. nov. Subhemisphæricum; nitidum; breviter albido-pubescens; nigrum; prothorace inmedio obsolete, ad latera crebre rugulose punctulato; elytris subtiliter leviter vix crebre punctulatis; segmentis ventralibus basali et apicali crebre rugulose, ceteris vix perspicue, punctulatis. Long., $\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

Australia; taken by Mr. Koebele; exact locality not specified.

CYCLOSCYMNUS, gen. nov. *(Coccinellidarum).*

Corpus minus pubescens, capite prothoraceque setis brevibus minus conspicuis sat sparsim vestitis; oculi sat subtiliter granulati fere paralleli; clypeus antice truncatus; antennæ ad basin apertæ, breves, 11-articulatæ; prosternum sat breve, in medio vix planato sed spatio lato mediano carina subtili utrinque marginato; scutellum perparvum; lamellæ abdominales segmenti basalis apicem attingentes, hujus cum margine postice confusæ; elytrorum epipleuræ sat horizontales haud integræ, ad femora recipienda foveolatæ; femora in sulcos recepta; suturæ ventrales bene impressæ; unguiculi appendiculati.

The species for which it is necessary to form this genus is very similar in general appearance to *Gymnoscymnus*, *Bucolellus*, and *Serangium*, but a glance at the structural characters will show that it cannot be placed in any of them. In Dr. Chapuis' arrangement of the *Coccinellidæ* its place is in the *Bucolites*. In my tabulation of the Australian *Coccinellidæ* (Trans. Roy. Soc., XI., pp. 1886-7) it falls into the Division "AA" along with *Serangium* and *Cyrema*, from both which the following characters in combination will distinguish it:—Prosternum not abnormally produced in front, nor having the median space abruptly flat.

C. minutus, sp. nov. Fere circularis; nitidus; sat convexus; piceus, elytris brunnescentibus, maculis ternis testaceis ornatis (his longitudinaliter in serie positis); in capite prothoraceque sparsim manifeste (in elytris vix manifeste) setis brevibus vestitus; supra sparsim minus fortiter (latera versus magis fortiter) punctulatus; prothorace fortiter transverso, hujus basi quam elytrorum basis vix angustiori; corpore

subtus sparsim minus subtiliter punctulato ; segmento ventrali apicali (? maris) crebre fortiter punctulato. Long., $\frac{3}{5}$ l.; lat, $\frac{3}{5}$ l. (vix).

This species is very easily recognisable by its markings, consisting of a longitudinal series of three pale testaceous spots on each elytron.

N.S. Wales ; Blue Mountains ; taken by Mr. Koebele.

BUCOLINUS, gen. nov. *(Coccinellidarum).*

Corpus pubescens ; oculi minus subtiliter granulati sat paralleli ; clypeus antice truncatus; antennæ ad basin apertæ elongatæ robustæ 11-articulatæ ; prosternum sat breve, antice transversim leviter convexum vix depressum nec carinatum ; scutellum modicum ; lamellæ abdominales integræ fortiter transversæ postice segmenti basalis ventralis apicem fere attingentes; elytrorum epipleuræ leviter concavæ longe pone elytrorum medium continuatæ, contra pedes intermedios et posticos foveolatæ ; corpus subtus ad femorum receptionem leviter excavatum ; unguiculi appendiculati.

The species for which I propose this name has very much the appearance of *Bucolus*, but though it is certainly near that genus structurally, it cannot be placed in it. According to Dr. Chapuis, the essential character of the *Bucolites* is a combination of the following,—antennæ exposed at the base, epipleuræ foveolated, body pubescent. The present genus presents this combination, and agrees with *Bucolus* in the following characters (by which Dr. Chapuis separates *Bucolus* from the other genera of the group)—claws appendiculate, abdomen consisting of five segments, no fossa under the anterior angles of the prothorax. It differs from *Bucolus*, however, in the absence of a chin-piece (mentonnière) in its comparatively long, stout antennæ, which are almost like those of a *Rhizobius*, in its clypeus not being at all expanded laterally, in its simple tibiæ, and in the different shape of its elytral epipleuræ, which are not nearly so wide in front as those of *Bucolus*, and are generally narrowed hindward to near the apex (the evenness of their narrowing being not much disturbed opposite the hind coxæ, whereas in *Bucolus* the epipleuræ are very wide in front, but suddenly become almost vertical,—apparently non-existent, opposite the hind coxæ). The eyes (as in *Bucolus)* are evidently less finely granulated than in *Scymnus*, but very much less coarsely than in *Rhizobius*. The abdominal lamellæ are very much like those of *Bucolus*, but do not quite so nearly reach the hind margin of the basal ventral segment.

B. longicornis, sp. nov. Late ovalis, fere subcircularis ; minus depressus ; albido-pubescens ; piceo-rufus capite prothoracis

lateribus antennis pedibusque dilutioribus, metasterno et segmenti basalis parte mediana nigris; capite prothoraceque subtiliter, elytris paullo magis fortiter, crebre punctulatis. Long., $1\frac{1}{2}$ l.; lat., $1\frac{1}{10}$ l.

Victoria; Alpine District.

Rhizobius.

R. major, Black. This species is very closely allied to *D. Boucardi*, Crotch; but I believe it to be a distinct species. I do not find any difference in the sexual characters. I have before me an example of *R. Boucardi* (female) which differs from *R. major* of the same sex as follows:—The general form is much more ashy-coloured instead of being clear bright fulvous, the general form is much more convex, and not so wide, the elytra are more nitid, and evidently less closely punctured, and the elevated middle space of the prosternum is differently shaped, being dilated immediately behind its front margin, and then distinctly narrowed again hindward, while the same piece in *R. major* is uniformly narrowed from the coxæ to the front margin.

R. nigronotatus, sp. nov. Ovalis, paullo elongatus; convexus; pallide fulvo-pubescens et setis erectis sparsim vestitus; rufis, elytris insigniter nigro-pictis; prothorace quam longiori vix duplo (postice quam antice haud multo) latiori, lateribus sat rotundatis, angulis anticis rotundatis posticis distinctis obtusis; capite prothoraceque vix perspicue elytris sparsim dupliciter (subtiliter et sat crasse) punctulatis; prosterno medio longitudinaliter anguste depresso, spatio depresso fere parallelo utrinque carinato antice obtuso. Long., 2 l.; lat. $1\frac{1}{5}$ l.

Very distinct by the sharply defined and conspicuous black markings on the elytra, which consist of a number of longitudinal lines forming (in the example before me) a strong vitta on either side the scutellum reaching nearly the middle of the elytra and dilated at its base, and several other vittæ which are dilated and run into each other here and there in such fashion as to form an irregular and very strongly zigzagged fascia near the apex not touching the lateral margin, and on each elytron a discal fragment of a fascia reaching neither the suture nor the lateral margin, and connected at its external side with the hinder fascia.

N.S. Wales; taken by Mr. Koebele.

R. ornatipennis, sp. nov. Sat late ovalis; sat convexus; pallide fulvo-pubescens et setis erectis sparsim vestitus; niger, capite prothoracis lateribus elytrorum partibus nonnullis [sc. margine laterali suturaque (his anguste), macula magna

humerali (hac postice bifida), macula elongata communi suturali mediana, et macula sat parva postmediana prope suturam] prosterno antennis palpis pedibus et abdominis lateribus apiceque rufo-testaceis ; prothorace quam longiori circiter duplo (postice quam antice haud multo) latiori, lateribus modice rotundatis, angulis anticis rotundatis posticis distinctis obtusis ; capite prothoraceque subtilissime, elytris sat crebre minus subtiliter, punctulatis ; prosterno medio longitudinaliter anguste depresso, spatio depresso elongato-triangulari antice sat acuto. Long., 2 l. ; lat., $1\frac{3}{10}$ l.

Distinguished from all the previously-described Australian *Rhizobii*, with a similar prosternal structure (except *R. nigronotatus)* by its elytra having well-defined markings. From *R. nigronotatus* it differs *inter alia* by the puncturation of its elytra.

Queensland ; taken by Mr. Koebele near Toowoomba, on *Eugenia*.

R. speculifer, sp. nov. Ovalis ; sat convexus, elytris minus longe pone scutellum fere subgibbosis ; pallide fulvo-pubescens et setis erectis sparsim vestitus ; rufus, prothorace plus minusve infuscato, elytris æneo-piceis ; prothorace quam longiori vix duplo (postice quam antice circiter tertia parte) latiori, lateribus subrectis, angulis anticis rotundatis, posticis fere rectis ; capite prothoraceque sat crebre vix fortiter, elytris sat fortiter vix crebre (quam *R. lituri*, Fab., paullo minus fortiter minus crebre, in spatio communi paullo pone scutellum obsolete) punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso triangulari utrinque carinato antice obtuso. Long., $1\frac{3}{5}$ l. ; lat., $1\frac{1}{10}$ l.

Easily distinguished by the almost lævigate common space on the elytra, a little behind the scutellum.

Queensland ; taken by Mr. Koebele on *Eugenia*.

R. Toowoombæ, sp, nov. Ovalis ; sat convexus ; pallide fulvo-pubescens et setis erectis sparsim vestitus ; rufo-testaceus, elytris æneis, prothorace nonnullis exemplis plus minusve infuscato ; prothorace quam longiori duplo (postice quam antice haud multo) latiori, lateribus vix arcuatis, angulis anticis rotundatis, posticis fere rectis ; corpore supra subtiliter minus crebre punctulato ; prosterno medio longitudinaliter depresso, spatio depresso elongato-triangulari utrinque carinato antice obtuso. Long., $1\frac{3}{10}$ l. ; lat., 1 l.

The elytral puncturation of this species is even finer than that of *R. debilis*, Blackb., from which it also differs (apart from very different colouring) in the sides of its flattened prosternal ridge

converging from base to front. The described species resembling it in color are all strongly punctured.

Queensland (Toowoomba).

R. satelles, sp. nov. Ovalis ; sat convexus ; pallide argenteo-albo- (nullo modo fulvo) pubescens et setis nigris erectis sparsim vestitus ; supra nigricans, corpore subtus piceo, antennis metasterni lateribus abdomine coxis genubus tarsisque rufescentibus ; prothorace quam longiori duplo (postice quam antice haud multo) latiori, subtilius punctulato, lateribus leviter arcuatis, angulis anticis rotundatis, posticis fere rectis ; elytris sat fortiter minus crebre punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso triangulari utrinque carinato antice subacuto. Long., $1\frac{1}{10}$ l.; lat., $\frac{4}{5}$ l. (vix).

Closely allied to *R. Lindi*, Blackb., but at once distinguishable by the short pubescence of the upper surface being silvery white (not at all fulvous), and the long setæ black. From *R. hirtellus*, Crotch, it differs *inter alia* by its smaller size and different colouring.

Queensland ; taken by Mr. Koebele.

R. Aurantii, sp. nov, Ovalis, elytris inpartibus duabus posterioribus æqualiter arcuatim angustatis ; subdepressus ; cinereo-fulvo-pubescens et setis pallidis erectis minus perspicuis vestitus ; piceo-niger, capite prothorace antice et ad latera elytrorum margine laterali summo antennis pedibus abdomineque rufis; prothorace quam longiori circiter dimidio latiori, antice modice angustato, lateribus sat arcuatis, angulis anticis rotundatis, posticis sat rectis ; prothorace sat fortiter, elytris æqualiter valde fortiter, sat crebre (fere ut *R. lituri*, Fab., sed multo magis æqualiter) punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso subtriangulari utrinque carinato antice vix acuto. Long., $1\frac{2}{5}$ l.; lat., $\frac{4}{5}$ l.

This species has little of the facies of a *Rhizobius*, owing to its depressed form and the shape of its elytra, which widen gently from the base hindward for only about one-third of their length, and then narrow gently, continuously, and arcuately to the apex. Viewed from the side the insect appears only about half as *high* as most of its congeners (*e.g.*, *discolor*, Er.); in its depressed form *R. cyaneus*, Blackb., approaches it. In colouring and puncturation it approaches *R. discolor*, Er., but with the punctures on the elytra evidently more even (*i.e.*, of more equal size and more equally distributed).

N.S. Wales ; Blue Mountains ; also taken by Mr. Koebele in Queensland.

R. fasciculatus, sp. nov. Late ovalis ; nitidus ; sat convexus ; niger, abdomine vix rufescenti, elytris violaceis, capite antice antennis palpis geniculis anticis tarsisque rufo-testaceis ; setis elongatis erectis nigris et fasciculis niveis brevioribus intermixtis vestitus ; capite prothoraceque minus sparsim elytris sparsissime inæqualiter, perspicue punctulatis ; prothorace quam longiori circiter duplo (postice quam antice haud multo) latiori ; prosterno medio planato, spatio planato lato postice sat parellelo antice acuminato. Long., $1\frac{1}{5}$ l. ; lat., $\frac{4}{5}$ l.

A very distinct species on account of the rich violet colour of its elytra, and the fascicles of snowy-white hairs with which they are spotted. The head of the type is so drawn back into the prothorax that I cannot examine the eyes very satisfactorily, but I can see that they are more or less coarsely granulated, and as all the other characters agree well with *Rhizobius*, I have no hesitation in referring the present insect to that genus.

Queensland ; taken by Mr. Koebele, near Toowoomba, on *Eugenia*.

R. apicalis, sp. nov. Ovalis ; sat convexus ; nitidus ; argenteo-pubescens et setis erectis pallidis sparsim vestitus ; piceo-niger, labro palpis antennis femoribus anticis tibiis tarsisque omnibus et abdomine plus minusve testaceo-rufis, elytrorum parte apicali (hac bene determinata) sanguinea ; prothorace circiter duplo (postice quam antice haud multo) latiori, antice utrinque oblique late obscure impresso, minus perspicue punctulato, lateribus fere rectis, angulis anticis rotundatis posticis sat rectis ; elytris sparsim sat fortiter punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso triangulari. Long., $1\frac{1}{5}$ l. ; lat., $\frac{4}{5}$ l.

The sharply defined bright-red apical part of the elytron readily distinguishes this species from all its near allies yet described.

N.S. Wales ; taken by Mr. Koebele in the Richmond River District.

R cœrulens, sp. nov. Ovalis ; sat convexus ; nitidus ; rufo-piceus, antennis palpis prothoracis lateribus et margine antico tibiis tarsisque dilutioribus, prothoracis disco elytrisque obscure cœruleis, ; fulvo-pubescens et setis fulvis sparsim vestitus ; prothorace quam longiori fere duplo (postice quam antice haud multo) latiori distincte sat crebre punctulato, lateribus leviter arcuatis, angulis anticis rotundatis posticis fere rectis ; elytris crebre minus fortiter punctulatis ; prosterno medio longitudinaliter depresso, spatio depresso lato parallelo. Long., $1\frac{1}{5}$ l. ; lat., $\frac{4}{5}$ l.

The blue colour of the elytra, together with the very distinct puncturation of the elytra and the unusual width of the longitudinal depressed space on the prosternum, readily distinguish this species.

Australia; taken by Mr. Koebele; the exact locality not known.

R. dorsalis, Blackb. (Tr. Roy. Soc., S.A., 1892, p. 70). For "(the puncturation is strong on the elytra, but) considerably less fine on the prothorax" read ". . . . considerably less so on the prothorax."

R. plebeius, sp. nov. Elongato-ovalis; sat convexus; setis fulvis sat brevibus erectis minus sparsim vestitus; rufo-piceus, antennis pedibus et epipleuris dilutioribus; capite prothoraceque vix manifeste, elytris sat crebre sat fortiter punctulatis; prothorace quam longiori fere duplo (postice quam antice haud multo) latiori, lateribus vix arcuatis, angulis anticis rotundatis haud productis posticis rectis; corpore subtus sat crebre minus subtiliter punctulato; prosterno medio æqualiter convexo nec planato nec carinato. Long., $\frac{4}{5}$ l.; lat., $\frac{3}{5}$ l.

Easily distinguished from the other described species having the prosternum similarly formed by its obscure dark-red colour and comparatively coarsely punctured elytra.

N.S. Wales and Queensland; taken by Mr. Koebele.

Since I furnished the Royal Society (in 1888) with a tabular statement of the distinctive characters of the Australian species of *Rhizobius*, so many additional species have been described in the first group of the genus (which I called "A") that a new tabulation seems to be called for, as follows—[In the case of *R. Evansi*, Muls., and *R. discolor*, Er., and also of *R. hirtellus*, Crotch, and *R. ruficollis*, Blackb., I am unable (for want in each case of a reliable type of one of the species) to set down a clearly intelligible record of a distinctive character; but in each case I believe that the species bracketed together are distinct *inter se.*]

RHIZOBIUS.

A. Median space of prosternum longitudinally flattened, and with a fine carina on either side.
B. Males distinguished by two large foveæ on the apical ventral segment.
C. Form oval.
D. Suture of the general colour.
E. Lateral margins of general colour, apex of elytra sanguineous.

F. Form convex, puncturation sparse and fine ... ... Boucardi, Crotch.
FF. Form depressed, puncturation stronger and closer ... major, Blackb.
EE. Lateral margin narrowly sanguineous ... ... Bakewelli, Crotch.
DD. Suture narrowly sanguineous ... carnifex, Muls.
DDD. Suture with a large sanguineous spot ... ... bajulus, Muls.
CC. Form narrow and elongate ... proprius, Blackb.
BB. Sexual characters not as in B.
C. Elytra uniformly piceous reddish or black, or with these colours indefinedly mingled (as from immaturity) and furnished with long erect hairs.
D. Colour of ventral segments uniform (or nearly so) with the undersurface.
E. Species of normally convex form.
F. Elytra more or less evenly punctured.
G. Prothorax conspicuously and closely punctured.
H. Prothorax (or at least its disc) coloured as the elytra.
I. Legs (especially the femora) more or less infuscate.
J. Size moderate or small (long. $1\frac{1}{2}$ l. or less).
K. Elytra uniformly shining piceous, slightly metallic-bronzy (less closely punctured) ... ... Lindi, Blackb.
KK. Elytra not at all metallic, usually in part rufescent (more closely punctured) ... dorsalis, Blackb.
JJ. Size large (long. 2 l. or nearly so) ... ... fugax, Blackb.
II. Legs entirely bright rufous or testaceous ... ... discolor, Er. / Evansi, Muls.
HH. Prothorax entirely bright rufous, in strong contrast to the elytra ... ... hirtellus, Crotch / ruficollis, Blackb.

GG. Prothorax scarcely distinctly punctulate.
H. Prothorax and elytra concolorous or nearly so.
I. Flattened ridge of prosternum elongate-triangular ... cæcus, Blackb.
II. Flattened ridge of prosternum with parallel sides debilis, Blackb.
HH. Prothorax red, in conspicuous contrast to the elytra ... ... Toowoombæ, Blackb.
FF. Elytra with a conspicuous common lævigate space a little behind the scutellum speculifer, Blackb.
EE. Form much more depressed than is usual in *Rhizobius* ... Aurantii, Blackb.
DD. Ventral segments rufo-testaceous, in strong contrast to the black sterna.
E. Puncturation of elytra close (as much so as in *R. discolor*, Er.) ventralis, Er.
EE. Puncturation of elytra much less close ... ... satelles, Blackb.
CC. Elytra not as in the preceding group ("C")
D. Elytra spotted with fascicles of white hair ... ... fasciculatus, Blackb.
DD. Elytra with a sharply-defined coloured pattern.
E. Elytra finely punctulate ... ... ornatipennis, Blackb.
EE. Elytra coarsely punctulate ... nigronotatus, Blackb.
DDD. Elytra blue or metallic.
E. Elytra pale reddish, with greenish opalescence ... ... insipidus, Blackb.
EE. Elytra dark blue (general form very elongate) ... ... cyaneus, Blackb.
EEE. Elytra bright metallic blue (general form oval) ... cœruleus, Blackb.
DDDD. Elytra piceous, with ill-defined reddish blotches læticulus, Blackb.
DDDDD. Elytra piceous, with the apex brightly sanguineous ... ... apicalis, Blackb.

ERITHIONYX (gen. nov.).

Rhizobio affinis differt oculis minus fortiter granulatis unguiculisque anterioribus 4 bifidis posticis appendiculatis.

Typ. *E. (Rhizobius) lanosus*, Blackb.

When I described *R. lanosus* (supra, p. 71) I noted the necessity of regarding it as forming a distinct sub-section of *Rhizobius*. In studying the further supply of material sent by Mr. Koebele, I find that the difference in the pubescence which gives it a facies, different from that of typical *Rhizobii* is accompanied by a very considerably finer granulation of the eyes, and the very peculiar character of the claws of the anterior four legs being strongly bifid while those of the hind legs are appendiculate. I must therefore form a new genus.

MIDUS.

According to Mr. Crotch, in his "Revision of the *Coccinellidæ*," *Scymnus stragulatus*, Er. (from Tasmania), belongs to this genus, which M. Mulsant founded (on an African species) as a subgenus of *Pharus*. Mr. Crotch states that it is a good genus on account of its elongate subdepressed form, complete abdominal plates, coarsely granulated eyes, and long antennæ. In his subsequent remarks Mr. Crotch seems to imply that he has not seen Erichson's species; but also states some of its characters with a preciseness that appears inconsistent with his not having seen it, making no remark on its antennæ beyond what is implied in associating it with the African species

Among the *Coccinellidæ* taken by Mr. Koebele in N.S. Wales and Queensland are three examples of an insect which, I think, is almost certainly congeneric with *S. stragulatus*, Er., and must be exceedingly close to it as a species. It is certainly not a *Midus*, as Mr. Crotch defines the genus; but it agrees very well with Mulsant's diagnosis of the same, which assigns to it eyes finely granulated. It differs also from the characters Mr. Crotch assigns to *S. stragulatus* in its elytral epipleuræ not being distinctly foveolate (although there is an exceedingly obsolete depression opposite the hind femora).

Unfortunately I have not an example of the African species of *Midus* for comparison, but I think it extremely improbable that this insect is really congeneric with them; as, however, it seems to agree (in respect of the characters its author assigns to the genus) with *Midus* of Mulsant, although differing from the flatly contradictory characters assigned by Mr. Crotch I think it will be best to regard this insect for the present as a *Midus*. It may be noted that it bears a great resemblance superficially (especially in respect of its colour and markings) to *Scymnus parallelus*, Blackb., but differs from that species in important structural characters, especially in the form of its abdominal lamellæ (which are transverse, their outline meeting the front margin of the segment externally quite close to the external

margin of the segment), in its first ventral suture not being enfeebled in the middle, and in the elytral epipleurae being continued back (gradually narrowing) very much nearer to the apex.

M. pygmæus, sp. nov. Ovalis, paullo elongatus ; sat convexus ; sparsim fulvo-pubescens ; supra piceo-niger, prothoracis lateribus et in elytris vittis dorsalibus singulis (his ante apicem introrsum flexis et suturam attingentibus) rufescentibus, corpore subtus rufescenti, antennis pedibusque testaceo-rufis ; capite prothoraceque sparsim subtilius punctulatis ; hoc quam longiori fere duplo (postice quam antice haud multo) latiori, a basi antrorsum angustato, lateribus vix arcuatis, angulis anticis leviter productis subacutis posticis obtusis; elytris confuse dupliciter (subtiliter et magis fortiter) minus crebre punctulatis ; segmento ventrali basali in medio sparsim subtiliter, ceteris magis fortiter sat crebre, punctulatis. Long., 1 l.; lat,, $\frac{3}{5}$ l.

Nearly allied to *M. stragulatus*, Er., but very much smaller, and with the lateral portions of the elytra entirely blackish, the breast not black, the head less finely punctulate, &c.

N.S. Wales and Queensland ; taken by Mr. Koebele.

MISCELLANEA.

List of Plants collected by Dr. Stirling in Central Australia between Frew Ponds (lat. 17°) and Mount Stuart (lat. 22°), on the Transcontinental Telegraph Route. By Professor Ralph Tate.

Capparideæ—*Cleome viscosa*, Mount Stuart.
Violaceæ—*Hybanthus enneaspermus*, Mount Stuart.
Sapindaceæ—*Dodonæa lanceolata.*
Malvaceæ—*Abutilon Fraseri*, between Mounts Stuart and Boothby.
Chenopodiaceæ—*Salsola Kali*, Mount Stuart.
Phytolaccеæ—*Codonocarpos cotinifolius*, Mount Stuart.
Leguminosæ—*Gastrolobium grandifolium*, *Acacia retivenea*, Attack Creek. *Erythina vespertilio.*
Proteaceæ—*Grevillia agrifolia*, Attack Creek. *Hakea macrocarpa.*
Combretaceæ—*Macropteranthes Kekwickii*, Frew Ponds.
Myrtaceæ—*Calycothrix microphylla*, Frew Ponds. *Melaleuca Leucodendron*, a shrub with red flowers in a close spike, Attack Creek.
Compositæ—*Minuria leptophylla*, *Helichrysum apiculatum*, Mount Stuart.
Asclepiadeæ—*Cynanchum floribundum*, Mount Stuart.
Solanaceæ—*Solanum Sturtianum*, *S. ellipticum*, between Mounts Stuart and Boothby.
Verbenaceæ—*Spartothamnus teucriifolius*, between Mounts Stuart and Boothby.
Bignoniaceæ—*Dolichandrone heterophylla*, Frew Ponds.
Myoporineæ—*Eremophila Latrobei*, Mount Stuart.

EXPLANATIONS TO PLATE V.

Fig.

1. Cypraea parallela, *Tate*. Slightly enlarged.

2-2a. Cypraea scalena, *Tate*. Dorsal and ventral aspects ; very slightly enlarged.

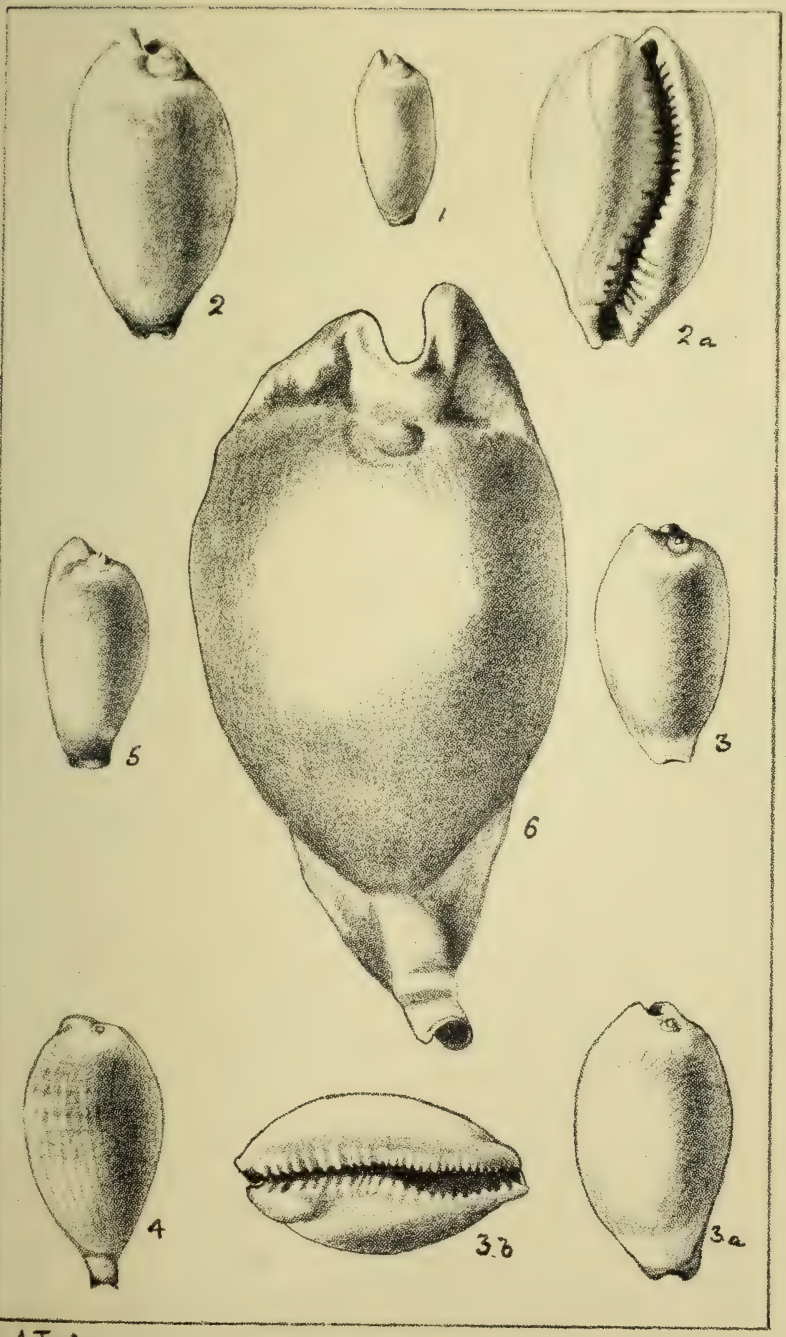
3. Cypraea subsidua, *Tate*. Slightly enlarged.

3a-3b. Var. Slightly enlarged.

4. Cypraea ampullacea, *Tate*. Nat. size.

5. Cypraea subpyrulata, *Tate*. Very slightly enlarged.

6. Cypraea toxorhyncha, *Tate*. Nat. size.



A. J. A.

EXPLANATIONS TO PLATE VI.

Fig.

1. Cypraea Archeri, *Ten.-Woods.* Nat. size.

2. Cypraea Jonesiana, *Tate.* Nat. size.

3. Cypraea brachypyga, *Tate.* Slightly enlarged.

4a-4b. Cypraea pyrulata, *Tate.* Dorsal and ventral aspects; slightly enlarged.

4c. Cypraea pyrulata, *var.*

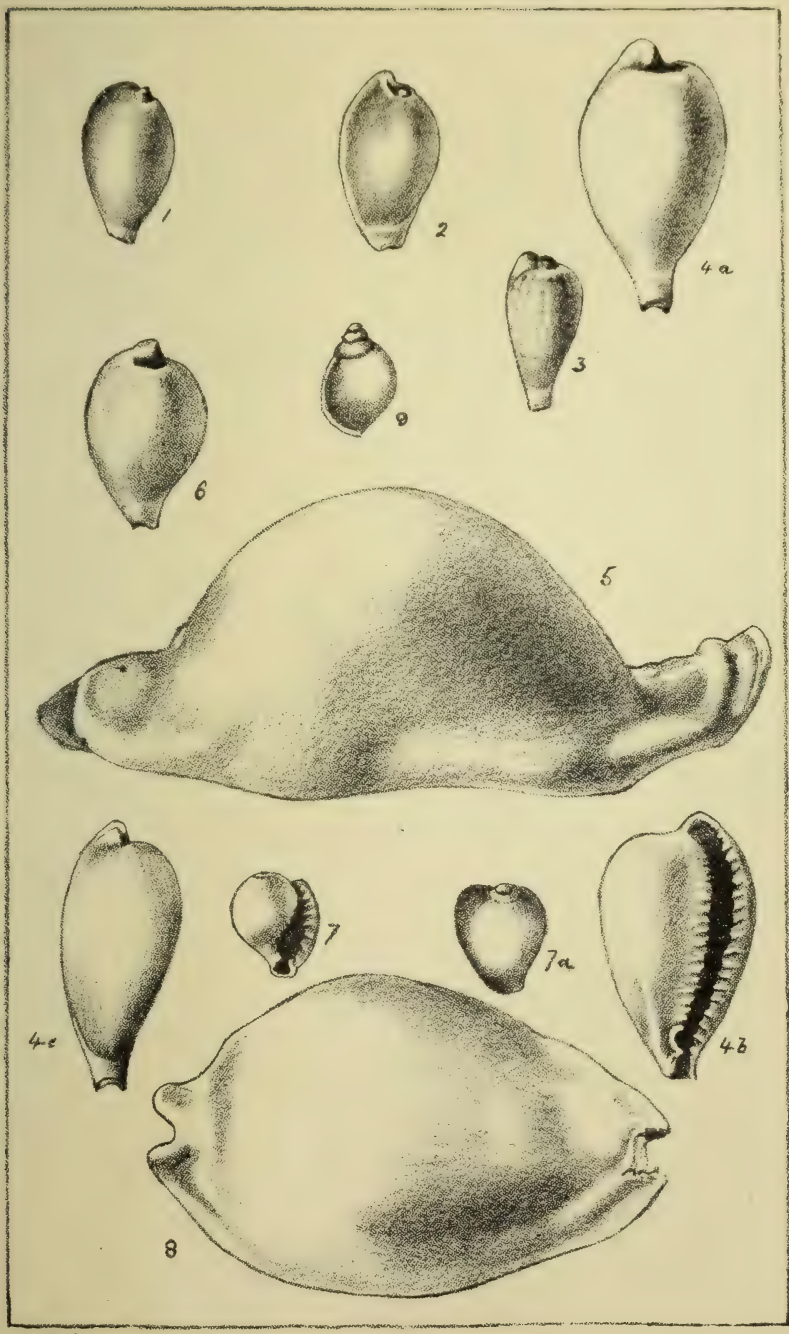
5. Cypraea toxorhyncha, *Tate.* Side view; nat. size.

6. Cypraea Murraviana, *Tate.* Nat. size.

7-7a. Cypraea ovulatella, *Tate.* Dorsal and ventral aspects; slightly enlarged.

8. Cypraea amygdalina, *Tate.* Nat. size.

9. Crossea sublabiata, *Tate.* 2 x.



A.T.A.

EXPLANATIONS TO PLATE VII.

Fig.

1. Conus cuspidatus, *Tate*. Nat. size.

1a. Id. Embryo ; much enlarged.

2. Conus Murravianus, *Tate*. Nat. size.

3. Conus ptychodermis, *Tate*. Nat. size.

4. Conus ligatus, *Tate*. Nat. size.

4a-4b. Var. Nat. size.

5-5a. Conus heterospira, *Tate*. Nat. size.

6. Conus Ralphii, *Ten.-Woods*. Nat. size.

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1a

2

3

4a

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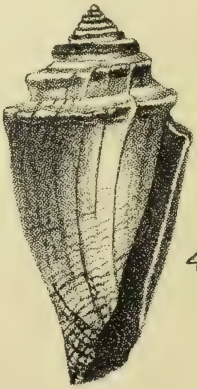

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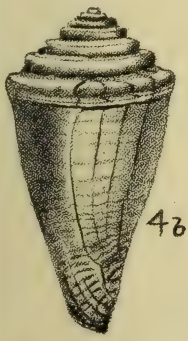

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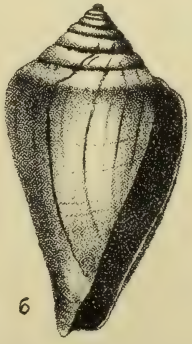

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5a

A.T.A.

EXPLANATIONS TO PLATE VIII.

Fig.

1. Conus extenuatus, *Tate*. Nat. size.

2. Scalaria microrhysa, *Tate*. 2 x.

3. Conus Hamiltonensis, *Tate*. Nat. size.

4-4a. Crossea lauta, *Tate*. 4 x.

5. Cypraea sphaerodoma, *Tate*. Nat. size.

6-6a. Crossea princeps, *Tate*. 3 x.

7. Conus acrotholoides, *Tate*. 2 x.

8. Conus complicatus, *Tate*. Slightly enlarged.

9. Conus ligatus, *Tate*. Slightly enlarged.

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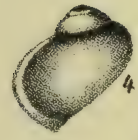
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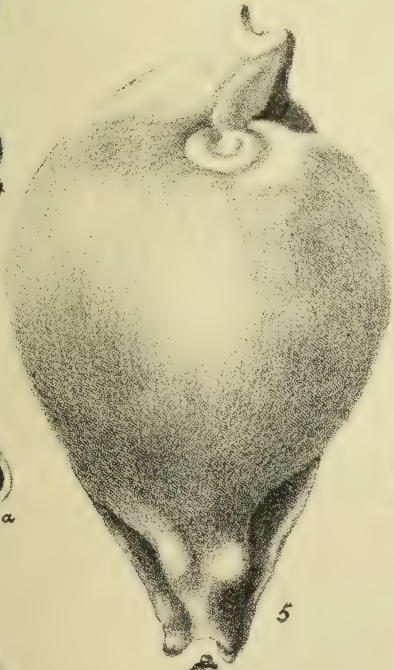
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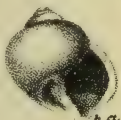
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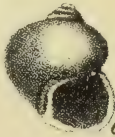
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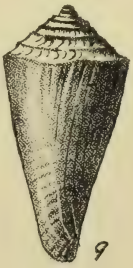
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A.F.A.

EXPLANATIONS TO PLATE IX.

Fig.

1. Cypraea (Cypraeidia) clathrata, *sp. nov.* Nat. size and enlarged ornamentation. Eocene—Aldinga.

2. Scalaria triplicata, *Tate.* Nat. size and enlarged ornamentation.

3-3a. Simnia exigua, *Tate.* Dorsal and ventral aspects. 2 x.

4. Cypraea Mulderi, *sp. nov.* Slightly reduced. Eocene—Fyansford, near Geelong.

5-5a. Trivia erugata, *Tate.* Ventral and dorsal aspects. 4 x.

6-6a. Sequenzia radialis, *Tate.* Basal and lateral aspects. 6 x.

7. Conorbis atractoides, *Tate.* Slightly enlarged.

Issued July, 1892.

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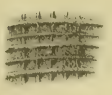

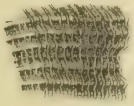

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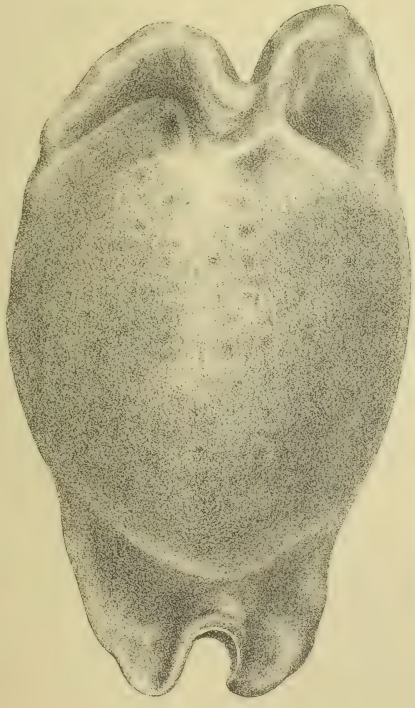

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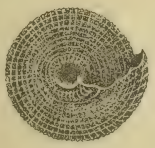

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H. B. lith.

Hussey & Co. Nigham [illegible]

EXPLANATIONS TO PLATE X.

Fig.

1. Scalaria interstriata, *Tate*. 2 x.
2. Scalaria orycta, *Tate*. 2 x and magnified ornamentation.
3. Scalaria glyphospira, *Tate*. 3 x and magnified ornamentation.
4. Cypraea dorsata, *Tate*. Dorsal aspect, slightly reduced.
5. Scalaria Hamiltonensis, *Tate*. 4 x.
6. Scalaria inornata, *Tate*. 6 x.
7. Scalaria eritima, *Tate*. 2 x and enlarged ornamentation.
8. Scalaria prionota, *Tate*. 3 x and magnified ornamentation.
9. Scalaria transenna, *Tate*. Slightly enlarged and ornamentation.

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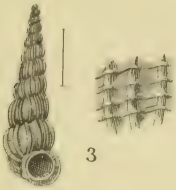
2



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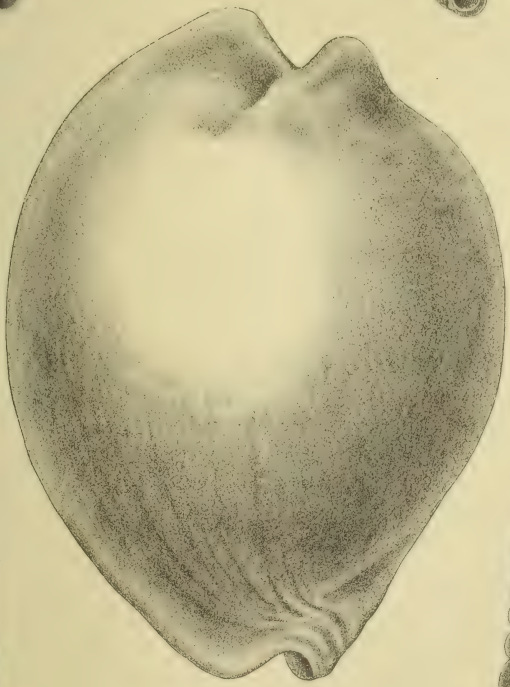

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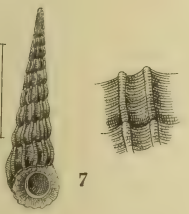

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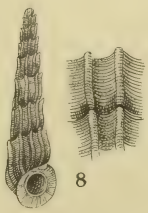

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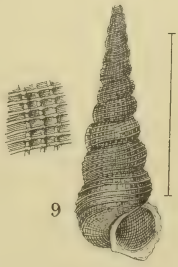

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HUSSEY & GILLINGHAM 11TH

EXPLANATIONS TO PLATE XI.

Fig.

1. Scalaria echinophora, *Tate*. 2½ x.

2-2a. Scalaria basinodosa, *Tate*. Ventral and dorsal aspects, 6 x.

3. Scalaria bulbifera, *Tate*. ·6 x.

4. Scalaria foliosa, *Tate*. Body-whorl, 3 x.

5. Scalaria loxopleura, *Tate*. 2 x; and body-whorl, much enlarged.

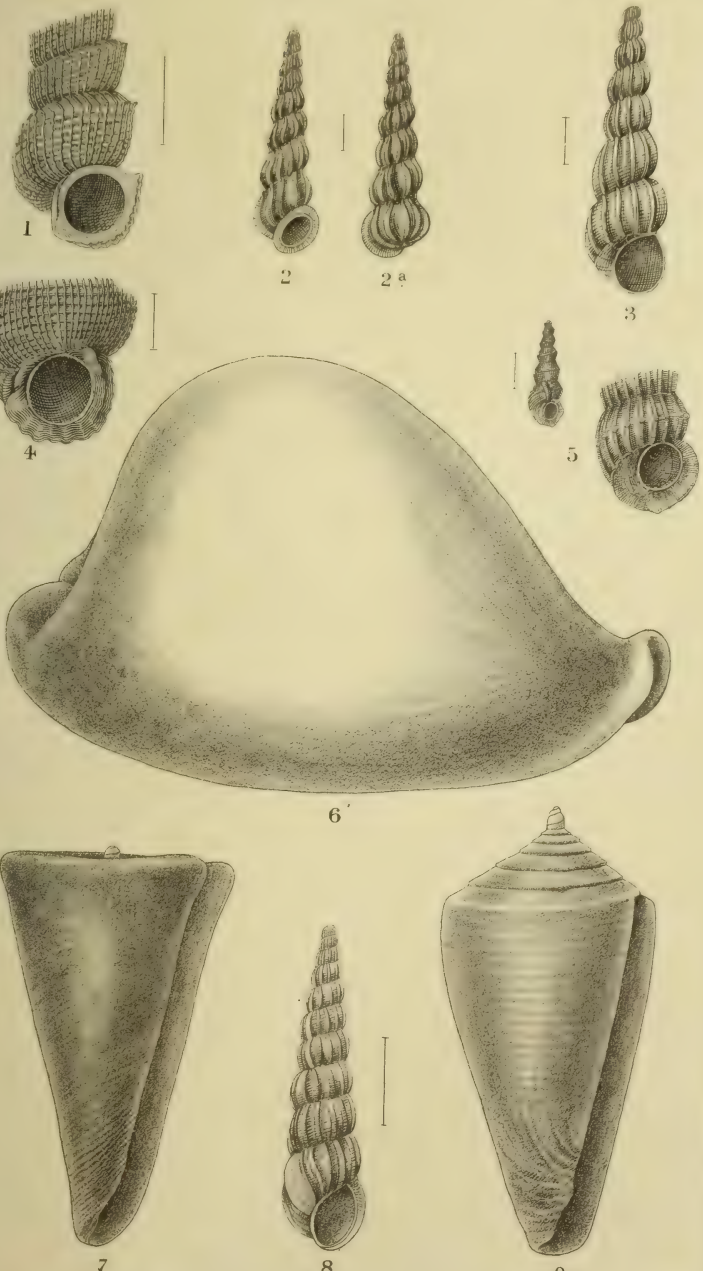
6. Cypraea dorsata, *Tate*. Lateral aspect; slightly reduced.

7. Conus Dennanti, *sp. nov.* (*C. pullulescens, var.*, Tate). Nat. size.

8. Scalaria lampra, *Tate*. 4 x.

9. Conus pullulescens, *Ten.-Woods*. Nat. size.

Issued July, 1892.



H. B. lith.

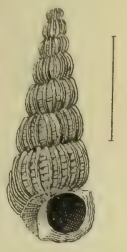
HUSSEY & GUNNINGHAM LITH.

EXPLANATIONS TO PLATE XII.

Fig.

1. Scalaria pleiophylla, *Tate*. 2 x.
2. Scalaria Mariæ, *Tate*. Nat. size.
3. Scalaria pachypleura, *Tate*. 3 x and apex magnified.
4. Scalaria mutica, *Tate*. 5 x.
5. Scalaria escharioides, *Tate*. 4 x and magnified ornamentation.
6. Scalaria cylindracea, *Tate*. 5 x.
7. Scalaria gonioides, *Tate*. 7 x (nearly).
8. Scalaria crebrelamellata, *Tate*. 3 x.
9. Scalaria polynema, *Tate*. 2 x and magnified ornamentation.
10. Scalaria (Hemiacirsa) dolicha, *n. sp.* 4 x and apex magnified Eocene—Schnapper Point.
11. Trichotropis accrescens, *Tate*. 2 x.
12. Trichotropis quinquelirata, *Tate*. $3\frac{1}{2}$ x.

Issued July, 1892.



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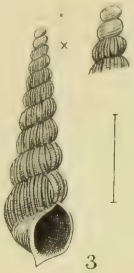

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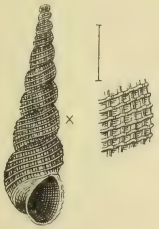

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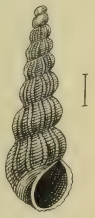

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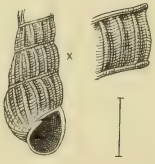

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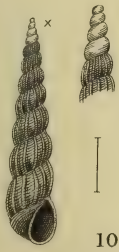

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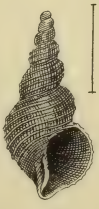

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H.B. lith.

HUSSEY & GILLINGHAM L.TH.

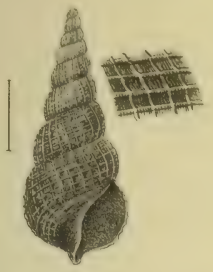
EXPLANATIONS TO PLATE XIII.

Fig.

1. Trichotropis apicilirata, *Tate.* 4 x and magnified ornamentation.
2. Trichotropis interlineata, *Tate.* 3 x and magnified ornamentation.
3. Trichotropis subquadrata, *Tate.* 6 x and magnified ornamentation.
4. Trichotropis tabulata, *Tate.* 5 x.
5. Trichotropis angulifera, *Tate.* 10 x.
6. Trichotropis triplicata, *Tate.* 10 x.
7. Trichotropis fenestrata, *Tate.* 10 x.
8. Trichotropis costata, *Tate.* 7 x.
9. Erato australis, *Tate.* 3 x.

10-10a. Erato minor, *Tate.* Ventral and dorsal aspects, 5 x.

11. Erato illota, *Tate.* Dorsal aspect, 5 x.
12. Erato pyrulata, *Tate.* Ventral and dorsal aspects, 3 x.



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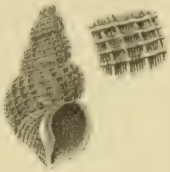

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BIBLIOGRAPHICAL NOTICES.

New South Australian Sun-Dew.—Mr. J. G. O. Tepper in "Botanisches Centralblatt," Cassel, 1892, describes as a new species *Drosera praefolia*, collected by him at Clarendon. It resembles *D. Whittakerii*, but blossoms before the leaves appear at the end of the autumn.

New South Australian Fungi.—Dr F. Ludwig in "Zeitschrift für Pflanzenkrankheiten," describes as a new *Puccinia Tepperi* a rust-affecting *Arundo Phragmites* at the Grange, near Adelaide. On other specimens of the same grass *P. Magnusiana*, Körnicke, has been detected. A second new species is *Puccinia (Leptopuccinia) munita*, which is parasitic on *Hydrocotyle hirta* inhabiting the Mount Lofty Range. The specimens which served for these determinations were collected by Mr. Tepper and communicated by him to Dr. Ludwig.

ABSTRACT OF PROCEEDINGS

OF THE

Royal Society of South Australia,

FOR 1891-92.

ORDINARY MEETING, NOVEMBER 3, 1891.

Prof. TATE, F.L.S. (Vice-President), in the chair.

EXHIBITS.—Prof. TATE, F.L.S., &c., showed some mammalian remains from the caves of Curramulka, Y.P. J. G. O. TEPPER, F.L.S., exhibited a new coccid, which had been named by Mr. Maskell, *Frenchia Casuarinæ*. S. CLARK showed the red and scarlet varieties of *Ptistes erythropterus*. A. ZIETZ (Assistant Director of the Museum) exhibited a stuffed specimen of a *Dendrolagus*, from New Guinea, which differed in some points from other described species.

PAPERS.—"Cambrian Rocks at Curramulka," by G. B. PRITCHARD. "New Species of *Fabularia*," by M. SCHLUMBERGER. "New Species of *Palparia*," by OSWALD LOWER. "Introduced Plants in the Northern Territory," by MAURICE HOLTZE.

ORDINARY MEETING, MARCH 1, 1892.

Rev. THOS. BLACKBURN, B.A. (President), in the chair.

MOTION.—It was moved and carried that the Royal Society of Victoria be empowered to officially speak for this Society in any representation that might be made to the Victorian Government remonstrating against the proposed curtailment of assistance to BARON F. VON MUELLER, K.C.M.G., on the ground that it would lessen the scientific and economic value of his work.

PAPERS.—"Remarks on the Volcanic Formation of the South-East," by WALTER HOWCHIN, F.G.S. "Notes on the Hobart Meeting of the Australian Association for the Advancement of Science," by W. B. POOLE. "Descriptions of New South Australian *Geometrina*," by OSWALD LOWER.

Ordinary Meeting, April 5, 1892.

Prof. Tate, F.L.S. (Vice-President), in the chair.

Exhibits.—A. Zietz (Assistant Director of the Museum) exhibited from Myponga, a piece of micaceous sandstone in form resemblinga Maori flax-beater. It was considered to have been formed by natural causes. J. G. O. Tepper, F.L.S., showed a collection of plants from Yilgarn, W.A., collected by Miss Rogers; also, a species of gregarious caterpillar spinning a common nest. They appeared to be nocturnal in their habits. The nests infested the *Acacia salicina*, growing between Moonta and Wallaroo, and were forwarded by Mr. Styles in October. The following December the cocoons were spun in the nest, and in February the *imago* emerged, and at once laid eggs, which were covered with the scales of the moth. Prof. Tate, F.L.S., laid on the table specimens of Tasmanian gems; a tooth of *Zeuglodon* from the Eocene of Tasmania, and a similitude of a shoe-last in ironstone.

Papers.—"List of S. A. Kangaroos and Wallabies," by A. Zietz. "Description of a New Species of *Stibaroma*," by Oswald Lower. "On the 'Dodging Tide' at Port Adelaide," by R. W. Chapman, M.A., and Capt. Inglis.

Ordinary Meeting, May 3, 1892.

Rev. Thos. Blackburn, B.A. (President), in the chair.

Exhibits.—Prof. Tate, F.G.S., exhibited the fossil cast of a gigantic tooth of *Carcharodon megalodon* found in the Eocene beds at Hamilton, Victoria. It measured five inches in length and four inches in breadth. Applying to this tooth the data arrived at by Dr. Bowerbank in 1852 from an investigation of the teeth of a specimen of *Carcharias glaucus* caught in Australian waters during the voyage of H.M.S. "Beagle," namely, that $10\frac{1}{5}$ times the length gave the vertical gape of jaw $8\frac{1}{5}$ times, the horizontal gape, and $169\frac{1}{7}$ times the length of the animal. The owner of the tooth exhibited must have had a vertical gape of jaw of 51 ins.; a horizontal gape of 41 ins.; and have measured 70 ft. 6 ins. in length. A. Zietz (Assistant Director of the Museum) showed stuffed specimens of *Chœropus*, or the pig-footed bandicoot, and compared them with specimens of *Peragalea lagotis* and *Perameles obesula*, the common bandicoot. J. G. O. Tepper, F.L.S., laid on the table a specimen of *Drosera præfolia*.

Papers.—"The *Phaneropteridæ* of Australia and Polynesia," by J. G. O. Tepper, F.L.S. "On the Origin of Spherical Conglomerations found in Central Australia," by Prof. Tate. "Descriptions of New Coleoptora," by Rev. Thos. Blackburn,

B.A. "The Energy of the Electro-magnetic Field," by Prof. Bragg, M.A.

Ordinary Meeting, June 7, 1892.

Rev. Thos. Blackburn, B.A. (President), in the chair.

Exhibits.—Oswald Lower laid on the table a case of the "Morpho" genus of butterflies. J. G. O. Tepper, F.L.S., exhibited moths bred from the galls of *Acacia pycnantha*, growing at Norwood. Upon these were two parasitic hymenoptera and two moths, identified by Mr. Oswald Lower as *Euzophera subarcuella* (Meyr.) and *Crocidosema plebiana*; also, a specimen of *Casuarina quadrivalvis* infected with galls of an uncommon kind; also, a plant of *Drosera præfolia*, which had developed leaves since last meeting. A. Zietz (Assistant Director of the Museum), showed specimens of *Ephthianura albifrons*, *E. aurifrons*, and *E. tricolor*, with their eggs and nests; also, *Cinclosoma castanotium*, with its eggs and nests, the latter being new to science. These were collected during the Elder Exploring Expedition. Also, *Oreoica* sp. (?), supposed to be new to science, collected by Mr. R. Helms, naturalist to the above expedition; also, a species of *Xerophila*, collected near Mount Birrell during the trans-continental trip of His Excellency the Governor, Lord Kintore.

Papers.—"Narrative of an Exploring Tour across Melville Island," by Maurice Holtze (Director of the Botanic Gardens). "Descriptions of New Lepidoptera," by Oswald Lower. A. Zietz (Assistant Director of the Museum) referred to a paper by Mr. D. S. Jordan "On the Effect of Temperature on the Development of Vertebræ amongst Fishes."

Ordinary Meeting, July 5, 1892.

Rev. Thos. Blackburn, B.A. (President), in the chair.

Exhibits.—Prof. Tate, F.G.S., exhibited a series of borings from Croydon Bore No. 2, received from the Conservator of Water. The last material was from a depth of 980 feet, and consisted of calcareous sands, with a few echinoids and a *Terebratulina Davidsoni*, and was probably of Eocene age. A. Zietz (Assistant Director of the Museum), showed some species of coots and water-hens, to be seen at present on the Torrens Lake, at Adelaide, namely, *Porphyrio melanotus*, *Tribonyx ventralis*, *Fulica australis*, *and Gallinula tenebrosa*.

Papers.—"Notes on some Habits of the Chingalee Tribe, N.T.," by A. G. B. Ravenscroft.

Ordinary Meeting, August 2, 1892.

Rev. Thos. Blackburn, B.A. (President), in the chair.

Exhibits.—Oswald Lower laid on the table a case of the genus *Thalaina*, a group of beautiful Australian moths. A. Zietz (Assistant Director of the Museum) exhibited the following birds from South America, namely, *Rupicola peruviana*, *Casmorhynchus carunculatus*, or bell-bird, *Calurus resplendens*; and from Sumatra, *Calymene viridis* and *Pitta granatina*. J. G. O. Tepper, F.L.S., showed a collection of *Gryllacridæ* and *Stenopelmatidæ*. T. W. Bednall forwarded the land and fresh-water shells collected by the Elder Exploring Expedition.

Ballot.—J. H. Maiden (Curator Technological Museum, Sydney) and Louis Schulz, Missionary, near Charlotte Waters, were elected Corresponding Members.

Papers.—The following papers on the Elder Exploring Expedition collections:—"Lepidoptera," by Oswald Lower; "Land and Fresh-water Shells," by T. W. Bednall; "Manna, Gums, and Resins," by J. H. Maiden; "New Species of Plants," by Baron F. von Mueller and Prof. Ralph Tate, F.G.S.

Ordinary Meeting, September 6, 1892.

Rev. Thos. Blackburn, B.A. (President), in the chair.

The President welcomed Mr. Robert Etheridge (Palæontologist of the Sydney Museum), and Hon. Fellow of the Society, to the meeting.

Exhibits.—Prof. Tate, F.G.S., exhibited Cambrian fossils found in South Australia. A. Zietz (Assistant Director of the Museum), showed native implements from the Solomon Islands, inlaid with mother-of-pearl. D. J. Adcock laid before the meeting specimens of *Voluta Adcocki*, which had been figured and described by Prof. Tate, F.G.S., under that name, in 1888. He explained that a very similar shell from Western Australia had been described (but not figured), by E. A. Smith, in 1886, under the name of *V. Guentheri*. Mr. Smith, on comparing the two, considered them con-specific.

Papers.—"Glacial Phenomena in the Mount Gambier District," by P. H. Priestley. "The *Gryllacridæ* and *Stenopelmatidæ* of Australia and Polynesia," by J. G. O. Tepper, F.L.S. "Supplement of Recent Bivalves," by Prof. Tate, F.G.S. "Diagnosis of New Mollusea," by Prof. Tate, F.G.S. "Descriptions of New Plants," by Prof. Tate, F.G.S. "Cambrian Fossils of South Australia," by Prof. Tate, F.G.S. "Notes on the Occurrence of *Hyalostelia*," by W. Howchin, F.G.S. "Liverworts of Elder Exploring Expedition," by F. Stephani, of Leipsic.

Annual Meeting, October 4, 1892.

Rev. Thos. Blackburn, B.A. (President), in the chair.

Auditor.—D. J. Adcock was elected to audit the accounts of the past year.

Reports.—The Annual Report of the Council and the Balance-sheet were read and adopted. The Annual Reports and Balance sheets of the Field Naturalist and Microscopical Sections were accepted.

Election of Council.—The Council for the ensuing year was elected as follows:—President, Prof. Tate, F.G.S.; Vice-Presidents, Rev. Thos. Blackburn, B.A., and Maurice Holtze, F.L.S. ; Hon. Treasurer, Walter Rutt, C. E. ; Hon. Secretary, W. L. Cleland, M.B., ; Members of Council, Prof. Rennie, D.Sc., E. C. Stirling, M.D., Walter Howchin, F.G.S., Samuel Dixon, J. S. Lloyd, and W. B. Poole.

Vote of Thanks.—A vote of thanks was carried to Dr. Cleland for his services as Hon. Secretary during the past year.

Retiring President.—The President, before vacating the chair, made a few remarks on the desirability of increased activity amongst scientific workers, to secure data before the natural conditions of the Province had been altered by the progress of civilisation and the occupation of the land.

Geological Congress.—The attention of the Fellows and Members of the Society was drawn to the notice that the Sixth Session of the Congrès Gèologique International, would be held at Berne, Switzerland, November, 1894.

Motion.—A requisition, signed by five Fellows of the Society, gave notice of a motion to alter Rules 36, 37, 48 and 49, at the November meeting. The one object was to have two Hon. Secretaries, so that one might act as a Librarian, the other, to enable an Auditor being elected at any meeting prior to the Annual Meeting.

Papers.—"Descriptions of New Coleoptera," by Rev. Thos. Blackburn, B.A. "The Coleoptera of the Elder Exploring Expedition," by Rev. Thos. Blackburn, B.A. "Critical Remarks on A. Bittner's 'Echinoiden des Tertiaires von Australien,'" by Prof. Tate, F.G.S. "Effects of Grazing on the Indigenous Vegetation," by S. Dixon.

ANNUAL REPORT.

The Council has to report that the scientific work of the Society has been carried on satisfactorily during the past year. Part I. of the current year's transactions was published in July, and it is anticipated that Part II., completing Vol. XV., will be ready for distribution in December. Vol. XVI. is reserved for the "Scientific Results of the Elder Exploring Expedition," and will appear simultaneously with the above.

During the past year two Corresponding Members have been elected, namely, J. H. Maiden, of the Technological Museum of Sydney, and the Rev. Louis Schulz, a missionary, living at Hermansburg, near Charlotte Waters, Central Australia. Both of these members have contributed valuable papers to the Society.

The following Fellows have resigned:—A. W. Fletcher, H. Foote, Dr. Gardner, A. L. Harrold, and J. W. Tyas.

The following Fellow has had his name removed by the Council for non-payment of arrears of subscriptions, namely, Jas. H Loughead.

The Council has the melancholy duty of reporting the death of an Hon. Fellow, Sir William Macleay; and of a Corresponding Member, J. Canham.

The ranks of scientific workers, and our list of Honorary Fellows, have suffered a loss by the death of Sir William Macleay, and though the deceased gentleman did not contribute to our transactions, yet, in other ways, he was directly of great service to the Society. Efforts are now being made to raise a sum of about £400, to be applied to the publication of a Macleay Memorial Volume; and, in a circular issued by the promoters, appeal is made to your liberality on the following grounds:—

(1) Sir W. Macleay was not only a liberal patron of science, but also an indefatigable worker in several of its branches.

(2) He spent large sums of money in forming an extensive collection of objects of natural history and of ethnological interest, and, in order to increase it, he, in the year 1875, purchased and fitted out the ship "Chevert," and at his sole expense conducted an expedition to the then little-known island of New Guinea, the result being that his museum was greatly enriched; the entire collection, valued at £23,000, he afterwards presented to the University of Sydney, together with the sum of £6,000 to enable the Senate to provide a salary for a curator.

(3) In the year 1874 Sir William established the Linnean Society of New South Wales for the cultivation and study of natural history in all its branches, on lines carefully thought out by himself; and as a proof that

the want of such an organisation was much felt, I may point out that all the leading scientific men of the colony at once enrolled themselves as members, that there has since been a constant accession of new members to fill the vacancies created by death or otherwise, and that the Society, while co-operating cordially with most of the leading societies of the same character throughout the civilised world, has greatly enhanced the scientific repute of New South Wales.

(4) In order to ensure the permanence of the Socieiy, its founder at his own expense erected and presented to it a most suitable building, and also presented an extensive collection of valuable scientific works, and ultimately endowed it with the sum of £20,000.

(5) In addition to the very substantial gifts before mentioned, for the promotion of science, Sir William Macleay has by his will bequeathed to the University of Sydney the sum of £12,000 for the foundation of a Chair of Bacteriology, and has set apart the further sum of £35,000 for the foundation and endowment after the death of his widow of four fellowships for the encouragement of scientific research, to be tenable by graduates in science of Sydney University.

It is decided that the proposed memorial shall take the form of a volume of original contributions by Australasian scientific workers, with illustrations of a superior character, preceded by a memoir and portrait of our deceased friend, because it is felt that this will me much more in accordance with his own ideas and with the spirit of his various benefactions than a monument of stone or bronze, and that such a volume will not only widely extend the knowledge of his great liberality, but will be of lasting value to all scientific men interested in studies and pursuits which so greatly interested him.

The membership of the Society consists, at the present time, of 9 Hon. Fellows, 78 Fellows, 14 Corresponding Members, and one Associate.

The Council has made arrangements through the courtesy of the Librarian of the S. A. Institute Circulating Library, to have the key of the Society's room hung in a convenient place, and easily accessible to those members who wish to consult the books in the Society's Library.

Numerous favorable replies have been received from European and American Scientific Societies agreeing to mutually exchange their publications with those of this Society. The titles of these appear at the end of the Society's Annual Volume.

The Council having learned during the past year that the Government of Victoria contemplated reducing the working staff of Baron F. von Muellor, at once wrote to the Royal Society of Victoria, offering to co-operate in any way in any movement that might be taken towards approaching their Government, and pointing out to it the extreme undesirability of curtailing the published results of Baron F. von Muellor's labors; as these were of the greatest scientific and economic value, not only to Victoria, but to Australia generally.

It will be a matter of satisfaction to the Members to know that the Council, with the permission of Sir Thomas Elder, K.G.M.G., has decided to print as a separate memorial volume or volumes,

the scientific results of the Elder Exploring Expedition ; and, that, acting on the authority of the munificent author of the Expedition, a portion of the results is already in type, and that a part will be issued almost at once, the editorial supervision being conducted by Prof. Tate, the Elder Professor of Natural Science at the University of Adelaide. During the past year the members at the monthly meetings have had frequent opportunities of inspecting the choiser portions of the collections of this Expedition.

The Council appointed Mr. Robert W. Chapman, M.A., to act as the Society's delegate at the Hobart Meeting of Australasian Association for the Advancement of Science.

The formation of an Astronomical Section of the Society has been approved, and its rôle already includes some thirty members

The statement of receipts and expenditure by the Hon. Treasurer (W. Rutt, C.E.) shows that a substantial balance still remains to the credit of the Society.

THE TREASURER IN ACCOUNT WITH THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Dr.	£ s. d.	£ s. d.
October 1st, 1891.		
To Balance		333 17 2
" Subscriptions—		
Royal Society	77 13 0	
Field Naturalists' Section ...	18 10 0	
Microscopic Section	3 10 0	
		99 13 0
" Grants—		
Government	96 18 0	
Barrier Miners' Association (towards Printing Map of Barrier District)	5 0 0	
		101 18 0
" Interest...		10 8 6
" Sale of Transactions		6 15 0
		£552 11 8

Cr.	£ s. d.	£ s. d.
By Cost of Transactions—		
Printing and Binding	132 12 0	
Illustrating	66 14 6	
Publishing	13 0 1	
		212 6 7
" Wages—Caretaker and Assistance in Library		2 5 0
" Printing, Postage, Telegrams, and Stationery		9 18 8
" Advertising		7 10 5
" Library—Shelving, &c.		1 7 0
" Grants—		
Field Naturalists' Section ...	25 0 0	
Microscopical Section	5 10 0	
Astronomical Section	10 0 0	
McLeay Memorial Volume ...	2 2 0	
		42 12 0
" Stamp Duty		0 2 6
Sept. 30, 1892.		
" Balance—		
Union Bank	30 18 6	
Savings Bank	245 11 0	
		276 9 6
		£552 11 8

Audited and found correct.

D. J. ADCOCK, Auditor.

October 3, 1892.

WALTER RUTT, Treasurer.

September 30th, 1892.

DONATIONS TO THE LIBRARY

For the Year 1891-92.

TRANSACTIONS, JOURNALS, AND REPORTS.

Presented by the respective Societies, Editors, and Governments.

Argentine States.

Buenos Aires—Revista Argentina de Historia Natural, tome I., entrega 4, 5, 6.

Austria and Hungary.

Berlin—Verhandlungen Gesellschaft für Erdkunde, band XVIII., Nos. 7 to 10; band XIX., Nos. 1 to 5.

——— Zeitschrift, ditto, band XXVI., Nos. 4 to 6; band XXVII., No. 1.

——— Sitzungsberichte Königlich Preussischen Akademie der Wissenchaften zu Berlin, Nos. 1 to 53 (1891); Nos. 1 to 25, 1892.

——— Abhandlungen der Königlich Preussischen Meteorologischen Instituts, band I., Nos. 4, 5.

——— Ergebnisse der Meteorologischen Beobachtungen, heft I., II., 1891; jahrbuch, 1888.

——— Monatliche Mittheil Gesammtgebiete der Naturwissenschaften, 4th year (1888-89).

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Munich—Abhandlungen der Mathematisch-Physikalischen Classe der K. B. Akad. der Wissenschaften, zu Munich, band XVII., 2.

Munich—Zitzungsberichte, ditto, heft III., 1889 ; heft I. to IV., 1890.

Vienna—Verhandlungen der K. K. Geologischen Reichenstalt, Nos. 8 to 18, 1891 ; Nos. 1 to 5, 1892.

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Wurzburg—Zitzungsberichte der Physikalisch-Medicinischen Gesellschaft, Nos. 1 to 9, 1891.

BATAVIA.

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BELGIUM.

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BRAZIL.

Rio de Janeiro—Revista do Observatorio, anno VI., Nos. 7 to 12 ; anno VII., No. 1.

CANADA.

Halifax—Proceedings Nova Scotian Institute of Natural Science, vol. VII., part 4.

Montreal—Canadian Record of Science, vol. IV., Nos. 6 to 8 ; vol V., No. 2.

———— Geological and Natural History Survey of Canada, Annual Report, 1888-89 ; Canadian Plants, part 6 ; Contributions Canadian Palæontology, vol. I., part 4.

———— Geological Survey of Canada, vol. IV., 1888-89.

Toronto—Transactions Canadian Institute, vol. II., part 2. Annual Archæological Report, 1891.

CHILE.

Santiago—Verhandlungen des Deutchen Wissenschaftlichen Vereins, band II., heft 3.

FRANCE.

Angers—Bulletin de la Société d' Etudes Scientifiques d' Angers, année XVIII., 1888 ; anneé XIX., 1889.

Caen—Bulletin de la Société Linnéenne de Normandie, vol. III (fourth series), 1888-89.

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GREAT BRITAIN AND IRELAND.

Belfast—Report and Proceedings Belfast Natural History and Philosophical Society, session 1890-91.
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——— Proceedings ditto, vol. II. (third series), Nos. 1 and 2.
——— Cunningham Memoirs ditto, No. 7.
——— Scientific Proceedings Royal Dublin Society, vol. VI., part 10; vol. VII., parts 1 and 2.
——— Transactions ditto, vols. VI., VII., VIII.
Edinburgh—Royal Physical Society, session 1891.
London—Journal Royal Microscopical Society, part 5, 1891; parts 1 to 4, 1892.
——— Proceedings Royal Society, Nos. 294 to 301, 307 to 312.
——— Catalogue British Museum—Birds, vol. XX.
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HUNGARY.

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INDIA.

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ITALY.

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JAPAN.

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New South Wales.

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——— Department of Mines—Records Geological Survey, vol. II., part 4, 1892; Memoirs ditto, Palæontology, No. 8, Australian and Tasmanian Aborigines, part 2; Annual Reports, 1890 and 1891.
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QUEENSLAND.

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RUSSIA.

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SOUTH AUSTRALIA.

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——— Meteorological Observations, Adelaide Observatory, 1889 (Charles Todd, M.A., C.M.G., F.R.S.).

——— Weather Reports, ditto, 1891-92.

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STRAITS SETTLEMENTS.

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UNITED STATES AMERICA.

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——— Circulars ditto, vol. XI., Nos. 92 to 100.
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——— Proceedings Boston Society Natural History, vol. XXV., parts 1, 2, 1890-91.
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——— Psyche—Journal of Entomology, vol. VI., No. 177 to 197.
——— Academy of Science, St. Louis, Report of Total Eclipse of Sun, Jan. 1st, 1889, at Norman, California.
Cincinnati, Ohio—Journal Comparative Neurology, vol. I. (Oct. number, 1891).
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Minneapolis—Bulletin Minnesota Academy of Natural Sciences. 1887-89.
Meriden, Conn.—Transactions of the Meriden Scientific Association, vol. IV., 1889-90.
New York—Transactions New York Academy of Sciences, vol. IX., Nos. 3, 4, 5, 8, 1889-90; vol. X., Nos. 2 to 6, 1890-91.
——— Annals ditto, vol. V., Nos. 4 to 8, 1890; Nos. 1 to 3, 1891, extra.
——— Journal New York Microscopical Society, vol. VII., No. 4; vol. 8, Nos. 2, 3.
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3, 1895 ; parts 1, 2, 3, 1891. On Toxic Effect Tubercle Bacilli. The Nautilus, vol. V., part 9.

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——— Bulletin Essex Institute, vol. XXI., Nos. 7 to 12, vol. XXII., Nos. 1 to 12. Our Trees, by J. Robinson

Sacramento—Californian State Mining Bureau : Annual Report and Maps ; Mineralogist's Report, 1890.

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Trenton—Journal New Jersey Natural History Society, vol. II., No. 2.

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——————— Monographs ditto, vol. I. (Lake Bonneville) ; vol. II., parts 1, 2 ; vol. VI. (Contributions to North American Ethnology)

——————— Annual Report ditto, 1887-88 ; ditto, 1888-89, parts 1, 2.

——————— Smithsonian Institution—Proceedings of the United States National Museum, vol. XIII., 1890 ; Report ditto, 1888 and 1889 ; Bulletin ditto, Nos. 41, 42; Report Smithsonian Institution, 1888 and 1889 ; "Omaha and Ponka Letters:" Catalogue Prehistoric Works East of the Rocky Mountains."

——————— U. S. Department of Agriculture—Bulletin, 1, 4, 7, 9, 13, 27, 32, 34, 97 ; Report of Secretary, 1891 ; Report of Statistician ; North American Fauna, No. 5 ; Reports, 91 (Crops of the Year), 92 (Use of Maize in Europe), 93 (Distribution and Consumption of Wheat), 94, 95 (Winter Grain, &c.), 96 (Acreage of Wheat, &c.)

VICTORIA.

Castlemaine—Report Schools of Mines and Industries, 1891.

Geelong—Report Gordon Technical College, 1891.

Melbourne—Victorian Naturalist, vol. VIII., No. 6 to 12, vol. IX., Nos. 1 to 6.

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———— Working Men's College Report, 1891.

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Perth—Government Geologist's Office Annual Report, 1890; Report on Gold Fields, Kimberly, W.A.

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Brüch, L.—Australian Medical Directory.
Dendy and Lucas—Study of Botany.
Hamilton, Sir Robert G. L., K.C.B.—Inaugural Address Aust. Assoc. Advanc. of Science, 1892.
Hayter, H. H., C.M.G., Government Statist, Victoria—Victorian Year Book, vol. II., part 2, 1890-91.
Liversidge, A., M.A., F.R.S.—Notes on some N.S.W. Minerals, No. 6.
Missouri Botanical Garden—Annual Report.
Mueller, Baron F. von—Iconography Australian Salsolaceous Plants, dec. VIII., IX.

LIST OF FELLOWS, MEMBERS, &c.

NOVEMBER, 1892.

Those marked (F) were present at the first meeting when the Society was founded. Those marked (L) are Life Fellows. Those marked with an asterisk have contributed papers published in the Society's Transactions.

Any changes in the addresses should be notified to the Secretary.

Date of Election.

HONORARY FELLOWS.

1857. BARKELY, SIR HENRY, K.C.M.G., K.C.B., F.R.S., Royal Colonial Institute, London.
1876. ELLERY, R. L. J., F.R.S., F.R.A.S., Government Astronomer, Victoria, The Observatory, Melbourne, Victoria.
1890. *ETHERIDGE, ROBERT, Palæontologist to the Geological Survey of New South Wales, Sydney.
1853. GARRAN, A., LL.D., Sydney, New South Wales.
1855. HULL, H. M., Hobart, Tasmania.
1878. JERVOIS, SIR W. F. D., K.C.M.G., C.B., F.R.S., Ex-Governor of South Australia, London, England.
1855. LITTLE, E.
1879. *MUELLER, BARON F. VON., K.C.M.G., F.R.S., M. and Ph.D., F.G.S., F.R.G.S., F.C.S., C.M.Z.S., &c., &c., Government Botanist, Melbourne, Victoria.
1876. RUSSELL, H. C., B.A., F.R.S., F.R.A.S., Government Astronomer, N.S.W., Sydney, New South Wales.

CORRESPONDING MEMBERS.

1881. BAILEY, F.M., F.L.S., Colonial Botanist, Brisbane, Queensland.
1881. *CLOUD, T. C., F.C.S., Manager Wallaroo Smelting Works, South Australia.
1888. *DENNANT, JOHN, F.G.S., F.C.S., Inspector of Schools, Camberwell, Melbourne, Victoria.
1880. *FOELSCHE, PAUL, Inspector of Police, Palmerston, Northern Territory, Australia.
1881. GOLDSTEIN, J. R. Y., Melbourne, Victoria.
1878. *HAYTER, H. H., M.A., C.M.G., F.S.S., Government Statist, Melbourne, Victoria.
1880. *KEMPE, REV J., Hermannsburg, Charlotte Waters, South Australia.
1889. *MACGILLIVRAY, P. H., M.R.C.S., F.L.S., Bendigo, Victoria.
1892. *MAIDEN, J. H., Curator Technological Museum, Sydney, New South Wales.
1888. *MASKELL, W. M., Wellington, New Zealand.
1886. NICOLAY, REV. C. G., Fremantle, Western Australia.
1880. *RICHARDS, MRS. A., Beltana, South Australia.
1892. *SCHULZ, REV. LOUIS, Hermannsburg, Charlotte Waters, South Australia.
1883. *STIRLING, JAMES, F.L.S., Assistant Geological Surveyor, Victoria.

FELLOWS.

1887. ADCOCK, D. J., Adelaide, S.A.
1874. ANGAS, HON. J. H., M.L.C., Adelaide, S.A.

1891. Ashby, Edwin, North Adelaide, S.A.
1887. Bagot, John, Adelaide, S.A.
1887. *Blackburn, Rev. Thomas, B.A., Woodville, South Australia.
1890. Board, Gregory, Metallurgist Port Pirie Smelting Works, Port Pirie, S.A.
1884. Boettger, Otto, Adelaide, S.A.
1886. *Bragg, W. H., M.A,, Professor of Mathematics University of Adelaide, S.A.
1882. Brown, L. G., Adelaide, S.A.
1883. *Brown, H. Y. L., F.G.S., Government Geologist South Australia, Adelaide.
1884. Bussell, J. W., F.R.M.S., North Adelaide, S.A.
1891. Calvert, A. F., Adelaide, S.A.
1888. Chapman, R. W., M.A., B.C.E., Lecturer on Mathematics and Physics University of Adelaide, S.A.
1879. *Cleland, W. L., M.B., Ch.M., F.R.M.S., J.P., Assistant Colonial Surgeon, Resident Medical Officer Parkside Lunatic Asylum, Lecturer on Materia Medica University of Adelaide, Parkside, S.A.
1876. (L) Cooke, E., Commissioner of Audit South Australia, Adelaide.
1880. Cox, W. C., Semaphore, S.A.
1887. *Dixon, Samuel, Adelaide, S.A.
1876. Dobbie, A. W., Adelaide, S.A.
1890. *East, J. J., F.G.S., Registrar School of Mines, Adelaide, S.A. (Corresponding Member, 1884).
1871. Elder, Sir Thomas, K.C.M.G., Adelaide, S.A.
1887. Eyres, Thomas, Adelaide.
1886. Fleming, David, Adelaide, S.A.
1876. Fletcher, Rev. W. Roby, M.A., Kent Town, S.A.
1882. Fowler, William, Kulpara, S.A.
1889. Fraser, J. C., Adelaide, S.A.
1891. Gill, Walter, F.L.S., Conservator of Forests South Australia, Adelaide.
1880. *Goyder, George, Jun., Government Analyst South Australia, Adelaide.
1890. Gray, Rev. William, Tanna, New Hebrides.
1887. Grasby, W. C., Editor *Garden and Field*, Adelaide, S.A.
1861. Hay, Alexander, Adelaide, S.A.
1882. Henry, Alexander, M.D., Adelaide, S.A.
1891. *Holtze, Maurice, F.L.S., Director Botanic Gardens, Adelaide (Corresponding Member, 1882), Adelaide, S.A.
1883. *Howchin, Walter, F.G.S., Goodwood, S.A.
1883. Hughes, H. White, Booyoolie, S.A.
1891. Johnson, J., M.D., F.R.C.S., Medical Officer Mount Gambier Hospital, Assistant Colonial Surgeon, Mount Gambier, S.A.
1853. (F) Kay, Robert, General Director and Secretary S.A. Public Library, Museum, &c., Adelaide, S.A.
1884. Lendon, A. A., M.D., M.R.C.S., Lecturer on Forensic Medicine and on Clinical Medicine University of Adelaide, Hon. Physician Adelaide Hospital and Children's Hospital, North Adelaide, Adelaide, S.A.
1856. Lloyd, J. S., Adelaide, S.A.
1888. *Lower, O.B., Parkside, Unley, S.A.
1885. *Lucas, R. B., Adelaide, S.A.
1873. Magarey, A. T., Adelaide, S.A.
1874. *Magarey, Hon. S. J., M.D., M.L.C., Adelaide, S.A.
1853. Mayo, George, F.R.C.S., Adelaide, S.A.
1874. Mayo, G. G., C.E., Adelaide, S.A.

1882. *Meyrick, E. T., B.A., Ramsbury, Hungerford, Wilts, England.
1880. Molineux, A., F.L.S., Secretary Central Agricultural Bureau South Australia, Kent Town, S.A.
1859 (L) Murray, David, Adelaide, S.A.
1884. Munton, H. S., Brighton, S.A.
1883. Phillips, W. H., Adelaide, S.A.
1886. Poole, W. B., Adelaide, S.A.
1882. Robertson, R., F.F.P.S., Adelaide, S.A.
1885. *Rennie, H. E., M.A., D.Sc., F.C.S., Professor of Chemistry University of Adelaide.
1885. Renner, F. E., M.D., Petersburg, S.A.
1891. Rogers, R. S., M.D., Adelaide, S.A.
1879. Russell, William, Port Adelaide, S.A.
1876. *Rutt, Walter, C.E., Adelaide, S.A.
1866. Salom, M., Adelaide, S.A.
1891. Saunders, Ernest C., Glenelg, S.A.
1891. Selway, W. H., Jun., Adelaide, S.A.
1886. Scott, James L., Hyde Park, S.A.
1857. Smeaton, Thomas D., Blakiston, Little Hampton, S.A.
1871. Smith, Robert Barr, Adelaide, S.A.
1882. Smythe, J. T., B.A., B.E., Inspector of Schools South Australia, Glenelg, S.A.
1881. *Stirling, Edward C., M.A., M.D., F.R.C.S., Lecturer on Physiology University of Adelaide, Hon. Director S.A. Museum, Hon. Surgeon Adelaide Hospital, Adelaide, S.A.
1878. Stuckey, J. J., M.A., Adelaide, S.A.
1876. *Tate, Ralph, F.L.S., F.G.S., Professor of Natural Science University of Adelaide.
1877 *Thomas, J. D., M.D., F.R.C.S., Adelaide, S.A.
1886 *Tepper, J. G. O., F.L.S., Entomologist S.A. Museum (Corresponding Member, 1878), Adelaide, S.A.
1856. *Todd, Charles, C.M.G., M.A., F.R.S,, F.R.A.S., Government Astronomer, Postmaster-General, and Superintendent of Telegraphs South Australla, Adelaide, S.A.
1889. Vardon, Joseph, J.P., Adelaide, S.A.
1878. *Verco, Joseph C., M.D., F.R.C.S., Lecturer on the Principles and Practice of Medicine and Therapeutics and on Clinical Medicine University of Adelaide, Hon. Physician Adelaide Hospital, Adelaide, S.A.
1883. Wainwright, E. H., B.Sc., St. Peter's College, S.A.
1878. Ware, W. L., Adelaide, S.A.
1879. Way, Edward W., M.B., M.R.C.S., Lecturer on Obstetrics and Diseases Peculiar to Women and Children University of Adelaide, Hon. Physician Adelaide Hospital, Adelaide, S.A.
1859. Way, Samuel J., D.C.L., Chief Justice and Lieutenant-Governor South Australia, Adelaide, S.A.
1882. *Whittell, Horatio, M.D., M.R.C.S., F.R.M.S., President Central Board of Health and City Coroner Adelaide, Adelaide, S.A.
1886. Wilson, John, F.E.T.S., Goodwood, S.A.
1886. *Zietz, A., Assistant Director S.A. Museum, Adelaide, S.A.

ASSOCIATE.

1884. Hodgson, Mrs., North Adelaide, S.A.

APPENDIX.

FIELD NATURALISTS' SECTION

OF THE

Royal Society of South Australia.

ANNUAL REPORT.

The Committee have to report as follows on the work of the Section for the year ending 30th September, 1892, this completing the ninth year of its existence.

Evening Meetings.—Eight evening meetings have been held during the year, the attendance at which showed a gradual improvement towards its close. The annual conversazione (held in November, 1891) was very largely attended, and a new feature of these gatherings was then introduced, viz., the exhibition of natural history objects by means of the oxyhydrogen microscope. The subjects of the papers read at the evening meetings have been of a varied character, and may be classified as follows :— Botany, 3 ; meteorology, 2 ; zoology, 1 ; geology, 1 ; miscellaneous, 1. Papers have been contributed by the following gentlemen :— J. G. O. Tepper, F.L.S., Maurice W. Holtze, F.L.S., R. W. Chapman, M.A., B.C.E., Captain Inglis, T. U. Scrutton, and E. Guest, whilst short addresses descriptive of exhibits have been given by Messrs. W. B. Poole, J. W. Bussell, A. Zietz, and D. J. Adcock. At these meetings there has usually been a fair number of exhibits, but the Committee would like to see more of the members contributing in this direction.

Excursions.—Towards the close of last year the interest in the excursions seemed to be waning, and consequently fewer have been held this year, the number being five. Those recently held, however, show a marked increase in the attendance, which, it is hoped will continue, as the practical study of Natural history out-of-doors was one of the chief reasons for the formation of the Section. The excursions include a dredging trip (the first after an interval of about two years), which proved a pleasant and successful outing.

Protection of our Native Fauna and Flora.—A separate report from this Committee is presented, in which is recorded the gratifying result of long-continued efforts to secure Government Farm as a National Park, vested in Trustees. Several other matters of general interest are dealt with in this report.

Corresponding Members.—Your Committee regret that the hope expressed in their last annual report as to the increased number of specimens expected from our corresponding members has not been realised. Although the sending of objects of natural History is only one amongst many directions in which the corresponding members are supposed to assist us, such contributions add largely to the interest of our evening meetings, and are eventually placed at the disposal of the Public Museum. Your Committee would urge these distant members not to abate the practical interest which many of them have in the past kindly shown in our work. In their last report the Committee referred to the pleasure derived from the receipt of a paper written by a corresponding member (Mr. J. G. McDougall), and they, therefore, learned with much regret of the recent decease of that gentleman, whose interest in natural history was shown in many ways.

Proposed Amalgamation with the Microscopical Section.—Believing that there is in this city too great a multiplication of Scientific Societies, your Committee have proposed an amalgamation with the Microscopical Section ; feeling that such a union would be to the advantage of both Sections, and lead to the economy of time, labor, and expense. A Sub-Committee has been appointed to consider the feasibility of the project.

Membership.—During the year five persons were elected members of the Section, and eleven names have been struck off the list. The number now on the roll (exclusive of corresponding members), is 97.

J. G. O. Tepper, Chairman.
W. H. Selway, Jun., Hon. Secretary.

Adelaide, 20th September, 1892.

FOURTH ANNUAL PROGRESS REPORT OF THE NATIVE FAUNA AND FLORA PROTECTION COMMITTEE.

In presenting their fourth annual report, the Committee have pleasure in directing attention to certain substantial results attained during the year.

National Parks.—After a long-continued struggle, Government Farm has at last been vested in Commissioners in perpetuity as a National Park. The board includes seven official and five

nominated members. Through the exertions of the Committee the President of the Royal Society was chosen as one of the official members, whilst of the five Government nominees three, including our Chairman, were recommended by the Committee. After careful consideration of the whole matter, we have come to the conclusion that it is inadvisable to attempt to secure the reservation of any lands on the Onkaparinga, as suggested by the Hon. T. Playford. Nowhere can a good river frontage on both sides be obtained, owing to the division of the land into small blocks. The character of the country is also so poor that it seems to us to be useless to proceed further in this direction. It is very greatly to be deplored that through the procrastination of the Government, the only tract of land near the city with a good river frontage should have been lost to the public.

Forest Reserves.—The land at Mount Crawford has occupied much of the attention of the Committee, but so far the steps taken have proved practically futile. The need of a forest reserve for supplying the city and neighbourhood with timber will be felt as years go on.

Game Laws.—The Commissioner of Crown Lands has again issued the customary placards notifying the chief provisions of the Game Acts. The Committee acknowledge gratefully the action taken by the Commissioner and the police officials. In 1891 an amending Game Act affording protection to the kangaroo was passed by the Legislature at the instance of Mr. Hancock. Although defective in certain particulars the measure has been the means of accomplishing considerable good. The imperfect character of that measure has induced the Committee to draft an amending and consolidating Bill, which has been submitted to the Government, who have promised to view the matter favorably.

Other action.—At the last meeting of the Australasian Association for the Advancement of Science a paper dealing with the whole subject was read by the Secretary, and was the means of arousing considerable interest in the question. It is to be hoped that at the next gathering of the Association (to be held in Adelaide) concerted action will be taken, and that in the meantime similar movements will be started in the other colonies.

In conclusion the Committee trust that further perseverance will gain further important results.

Saml. Dixon, Chairman.
A. F. Robin, Hon. Sec.

Adelaide, 20th September, 1892.

FIELD NATURALISTS' SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

Receipts and Disbursements for the Year 1891-2.

Dr.

Receipts.	£	s.	d.
To Balance brought forward	4	4	1
" Grants from Royal Society	25	0	0
" Subscriptions	18	10	0
	£47	14	1

Cr.

Disbursements.	£	s.	d.	£	s.	d.
By Printing—Proceedings	5	1	0			
General	3	17	6			
Chairman's Address ...	2	0	0			
(S. Dixon, 22.9.91.)				10	18	6
" Postages				4	7	0
" Conversazione				4	5	6
" Advertising				2	15	6
" Attendance				2	0	0
" Sundries				0	11	9
				24	18	3
" Subscriptions, as per contra, handed over to Royal Society				18	10	0
" Balance in Hand				4	5	10
				£47	14	1

Audited and found correct.

J. H. C. LANGDON,
THOS. EVANS, } Auditors.

Adelaide, 19th September, 1892.

W. H. SELWAY, Jun., Hon. Sec.

MICROSCOPICAL SECTION

OF THE

Royal Society of South Australia.

ANNUAL REPORT, 1891-92.

The Committee beg to submit their seventh annual report as follows :—The meetings of the Section have been very fairly attended considering the small number of active members now on the roll, and much interest has evidently been manifested in the various subjects brought forward.

We regret that several members have resigned during the year, and amongst them our Chairman, Mr. J. Colbourne, who has removed to Sydney. We shall feel the loss very much, as he was one of those who joined on the formation of the Section, in August, 1885, and he has always taken an active part in it as far as his time would allow.

Only two excursions have been held during the year, one of which was a dredging expedition down the Port River, in conjunction with the Field Naturalists' Section. Several others were arranged for but had to be given up in consequence of the bad weather.

We are not able to report any additions to the library since last year, but a large number of Microscopical Magazines, which have passed round to the members, are in the hands of the binder, and will shortly be available for issue. The Council of the Royal Society having lately handed over for the use of members of the Section their bound volumes of the Journal of the Royal Microscopical Society, members are now able to consult this valuable publication. In addition to this the following magazines are subscribed for by the Section, and are issued to members to read at home :—"Journal of the Queckett Club," "The American Microscopical Journal," "The International Journal of the Microscopical Science, &c."

The number of members at present is 24, and the average in attendance at the meetings has been 9.

The following subjects were discussed at the meetings :—

1891.

Oct. 13. Exhibition of objects, photo-micrographs, &c.

Nov. 10. Demonstration on measurement of aperture of objectives, by Mr. W. B. Poole.

April 12. Demonstration of photo-micrography, by the Secretary, Mr. J. W. Bussell.

May 10. Remarks on mouth parts of locusts, illustrated by mounted specimens, by Dr. Whittell.

June 14. Gossip meeting and exhibition of objects.

July 12. Paper on fermentation, by Mr. A. Dale.

Aug. 9. Remarks on secondary structure of diatoms, illustrated by photo-micrographs, shown by lantern, by Mr. W. B. Poole.

The balance-sheet submitted herewith shows a balance of £3 9s. 0d. in hand after repayment of subscriptions handed over to the Treasurer of Royal Society.

MICROSCOPICAL SECTION OF THE ROYAL SOCIETY OF SOUTH AUSTRALIA.

STATEMENT OF RECEIPTS AND EXPENDITURE FOR YEAR ENDING 30TH SEPTEMBER, 1892.

RECEIPTS.	£	s.	d.
Balance in hand 30th September, 1891	3	12	5
Subscriptions received	3	10	0
Balance due Secretary	0	1	0
	£7	3	5

EXPENDITURE.	£	s.	d.
Magazines	1	8	6
Advertising	0	6	0
Stationery	0	4	6
Postages	0	11	11
Attendance	1	2	6
Subscriptions Paid Royal Society	3	10	0
	£7	3	5

Audited and found correct.

C. C. PRESGRAVE, Auditor.

Sept. 17, 1892.

D. FLEMING, Treasurer.

W. J. BUSSELL, Hon. Secretary.

GENERAL INDEX.

[The species and genera, the names of which are printed in italics, are described as new.]

Aboriginal Habits and Customs, 121.
Acridopeza reticulata, 80.
Agnapha fusca, 111.
Agrilus *Terræ-reginæ*, 220.
Alectoria superba, 87.
Ambonychia *macroptera*, 185.
Ametrosomus Helmsi, 169.
Ametrus tibialis, 169.
Amphicroum *Adelaidæ*, 23; cribriceps, 23.
Aphodius *Frenchi*, 35; *Lindensis*, 35; Tasmaniæ, 209; *Yorkensis*, 209.
Aposites *lanaticollis*, 61; *niger*, 62.
Apotrechus ambulans, 167; unicolor, 167.
Apteronomus Bordaensis, 168.
Arthropterus *foveipennis*, 24; *occidentalis*, 25.
Astræus, navarchis, 211; Oberthueri 211; *simplex*, 211.
Atænius *mendax*,36; *torridus*, 36.
Atomaria *eucalypti*, 33.
Aulacomera acuminata, 113; incerta, 112; insularis, 112.
Aulacophora occipitalis, 237
Australian Coleoptera, 20, 207; Fossils, 183; Gryllacridæ, 137; Lepidoptera, 5; Mollusca, 125; Phaneropteridæ, 77; Stenopelmatidæ, 137; new species of.
Barbatia Carpenteri, 135.
Bebius *variegatus*, 64.
Berosus majusculus, 207.
Betheluim *mundum*, 57; *tricolor*, 56.
Bittner, A., Echinoids of the Australian Tertiaries, 190.
Blackburn, Rev. T., on New Genera and Species of Australian Coleoptera, 20, 207.
Botany of Melville Island, 118.
Bragg, The Energy of the Electro-magnetic Field, 74.
Bubastes *vagans*, 213.
Bubastodes sulcicollis, 212.
Bucolinus longicornis, 252.
Bucolus *convexus*, 72.
Cadecia acutifolia, 93; bispinulosa, 93; concisa, 88; *halmaturina*, 91; *hirsuta*, 93; hospes, 92; inermis. 91; longipennis, 88; *longipennioides*, 89; marginata, 88; major, 90; minor, 92; obtusifolia, 92; olivacea, 90; pictipes, 87; porrecta, 95; roseopennis, 94; scalaris, 92; septentrionalis, 90; valida, 89.
Cambrian Rocks at Curramulka, 179; fossils of, 183; glaciated rock-surfaces at, 182.
Cardiothorax *aeripennis*, 226.
Cardita bimaculata, 134; *gemmulifera*, 130.
Casigneta lamellosa, 82.
Chartopteryx *Victoriensis*, 226.
Chilocorus *flavidus*, 239.
Chingalee Tribe, Habits and Customs of, 121.
Clavagella multangularis, 134.
Coccinella Kingi, 238.
Coelophora *guttata*, 238; Mastersi, 238.
Coleoptera, New Genera and Species of, 20, 207.
Colon *Melbournense*, 25.
Columbella *cominellæformis*, 126.
Coscinocyathus *Etheridgei*, 188.
Cryptamorpha *Macleayi*, 31.
Cryptophaga *Blackburnii*, 15; *delocenrta*, 16; *ochroleuca*, 15.
Cryptophagus *gibbipennis*, 32.
Curis *discoidalis*, 214.
Curramulka, Cambrian Rocks at, 179.
Cyclaster Archeri, 193.
Cycloscymnus minutus, 251.
Cyria *tridens*, 41, 215.
Daedrosis *monticola*, 227.
Diastella flexuosacercata, 96; latifolia, 95.
Dichromodes *ptilomacra*, 8.
Dictyota costulata, 98; *Elderi*, 99; *indivisa*, 98; pruinosa, 99; viridissima, 97.
Didymocantha *novica*, 233.
Diplodonta Adamsi, 134.
Dixon, S., on the Effects of Settlement and Pastoral Occupation in Australia upon the Indigenous Vegetation, 195.
Donacia *Australasiæ*, 235.
Ducetia Japonica, 80.
Dyscolocerus *heros*, 56.
Dysostines, 229.
Echinoids of the Australian Eocene, 180, 190.
Echinolampas posterocrassus, 193.
Ectorisma granulata, 127.
Ectosticta *ornata*, 66.
Egleis varicolor, 238.
Electro-magnetic Field, Energy of, 74.
Elephantodeta eburnata, 109; farinosa, 110.
Eleusis *parva*, 24.
Eocene Echinoids, 180, 190; rocks and fossils, 179.
Eonius atrifrons, 164; *fumatus*, 165; *tigrinus*, 163.
Epacra aenea, 166; modesta, 166.
Ephippthyta *quadrigesimaguttata*, 84; trigintiduoguttata, 83.
Ephippthytoidea sparsa, 85.
Eremus Muelleri, 166; spinulosus, 165.
Erithionyx lanosus, 259.
Eurispa *fraterna*, 68; *nigripes*, 67; *simplex*, 68.
Fibularia gregata, 192.
Glacial Phenomena about Mount Gambier, 123.
Glaciated Rock-surfaces at Curramulka, 182.
Gryllacridæ of Australia, 137.
Gryllacris adventa, 153; appendiculata, 149; *atrogeniculata*, 144; aurantiaca, 149; cyanea, 143; debilis, 151; demidiata, 148; dubia, 149; excelsa, 149; exigua, 152; *ferrotestacea*, 147; ferruginea, 152; gemina, 153; hyalena, 152; *incerta*, 154; ligata, 151

Gryllacris *longicornis*, 146; *lutescens*, 148; magnifica, 143; major, 153; *marmoricepa*, 145; *Molineusiana*, 155; oceanica, 150; *paulula*, 155; straminea, 150; subdebilis, 151.
Gymnoscymnus quadrimaculatus, 242.
Hectomanes *pteromela*, 5.
Hepialus *Blackburnii*, 5.
Heteromastix *anticus*, 221; *dilataticollis*, 222.
Holtze, Introduced Plants in the Northern Territory, 1; Exploring Tour across Melville Island, 114.
Hoplozonitis mira, 229.
Howchin, W., Note on Hyalostelia, 188.
Hyalostelia, sp., 187.
Hydriomena *gypsonela*, 11.
Hyolithes communis. 186; *conularioides*, 186.
Hyperomma *abnorme*, 22.
Hypochroma *eugramma*, 14.
Hypocyrema pauxillum, 251.
Hypostigmodera variegata, 215.
Idæthina cincta, 29.
Indigenous Vegetation, the Effects of Settlement and Pastoral Occupation upon, 195.
Introduced Plants in the Northern Territory, 1.
Iodis *ipomopsis*, 14.
Isostira *raucipennis*, 225.
Kangaroos of South Australia, List of, 18.
Laemophloeus *Australasiæ*, 30.
Lamellibranch Mollusca of South Australia, 133.
Lemidia *angustula*, 224; *leoparda*, 224; *munda*, 223; *pictipes*, 222; *pulchella*, 223; *simulans*, 222; *soror*, 223.
Leperditia, spp., 187.
Lepidoptera, new species, 5.
Lichenaula *selenophora*, 16.
Lima squamosa, 136.
Lipernes *subviridis*, 72.
Lithodomus *cuneiformis*, 131; *projectans*, 130.
Litochrus *Sydneyensis*, 26.
Lower, O., Descriptions of New South Australian Lepidoptera, 5.
Lucina *perobliqua*, 128,
Lucina, *paupera*. 129.
Lygesis *ornata*, 63.
Machima phyllacantha, 81.
Maechidius *tibialis*, 210.
Mandolotus, 229.
Marine Mollusca, New Species of, 125.
Maulia picticornis, 65.
Megamerus *mandibularis*, 67.
Melobasis *Derbyensis*, 44.
Melville Island, Exploration of, 114; List of Plants of, 118.
Microdiscus *subsagittatus*, 187.
Microtragus *quadrimaculatus*, 235.
Midus *pygmaeus*, 261; strangulatus, 260.
Mollusca, New Species of, 125; List of, 133.
Monoctenia *calladelpha*, 7; *eximia*, 7.
Monostychia Etheridgei, 192.
Mount Gambier, Glacial Phemonena about, 123.
Myletta, spp., 135.
Myrabolia *Lindensis*, 31; *parva*, 32.
Myrina *crenatulifera*, 131.
Mysella *ovalis*, 128; List of, 133.
Naranio rubiginosa, 134.
Neanius lobatus, 163.
Neda *bicolor*, 238.
Neobubastes aureocincta, 213.
Neocuris *dilataticollis*, 42; *nigricans*, 43.
Northern Territory, Introduced Plants in, 1.
Notobrachypterus australis, 27; *bifoveatus*, 28 *creber*, 27; *liliputanus*, 29; *nitidiusculus*, 28.
Olenellus *Pritchardi*, 187.
Onthophagus *Blackwoodensis*, 208: *Geelongensis*, 35; *Henleyensis*, 208; *nitidior*, 209.
Ophileta *subangulata*, 184.
Opsidota *guttata*, 64.
Orcus Australasiæ, 240; *ovalis*, 240; *punctulatus*, 240; *splendens*, 240.
Orthis *peculiaris*, 185.
Orthisina *compta*, 185.
Pachypodagrus crassipes, 176; *Magareyi*, 177.
Palleobranch Mollusca of South Australia, 133.
Palparia *leucosta*, 10.
Paracaedicia nigro-punctata, 104; planicollis, 103; raroramosa, 102; serrata, 103; spinosa, 103; tibialis, 102; verrucosa, 104.
Paradoxechinus novus, 191.
Paragryllacris callosa, 158; combusta, 157; *deserta*, 162; exserta, 160; infuscata, 157; *insignis*, 161; latelineolata, 158; lobata, 160; modesta, 161; *pallidolinea*, 159.
Paromalus *Ludovici*, 26.
Paropsis *rufopicta*, 237.
Pastoral Occupation, its effects upon the Indigenous Vegetation, 195.
Pecten undulatus, 136.
Penthoptophora Driffieldi, 175.
Pephricus *squalidus*, 232; *umbratus*, 231.
Phanoptera subnotata, 111.
Phaneropteridæ of Australia, 77.
Phaula denticauda, 83; peregrina, 83.
Philhydrus laevigatus, 207.
Phylomictis *monochroma*, 17.
Platyceras *Etheridgei*, 184
Plants introduced in the Northern Territory, 1.
Platyphanes *creber*, 225.
Polichne argentata, 101; brevipes, 101; *ferruginea*, 100; longipes, 101; parricauda, 100; spinulosa, 102.
Polynesia, Gryllacridæ, 137; Phaneropteridæ, 71; Stenopelmatidae of, 137.
Priestley, Notes on Glacial Phenomena about Mount Gambier, 123.
Pritchard, G. B., Cambrian Rocks at Curramulka, 179.
Proctammodes, 37.
Protina guttulata, 96.
Psammechinus Woodsi, 191.
Pseudoryctes *tectus*, 211.
Quedius *pictipennis*, 21.
Ravenscroft, Habits and Customs of the Chingalee Tribe, 121.
Rhizobius *apicalis*, 256; *aurantii*, 255, *caecus*, 71; *coerulens*, 256; *dorsalis*, 70, 257; *fasciculatus*, 256; fugax, 70; *lanosus*, 71; major, 253; *nigronotatus*, 253; *ornatipennis*, 253; *plebeius*, 257; *pulcher*, 71; *sabelles*, 255; *speculifer*, 254; *Toowoombae*, 254.
Rhyparida *Mastersi*, 236.
Rupilia *rugulosa*, 238.
Salterella *planoconvexa*, 186.
Scopaeus *femoralis*, 22; dubius, 23; latebricola, 23; obscuripennis, 23.
Scymnodes *Koebeli*, 69, 242; tenebricosus, 69.
Scymnomorpha duplopunctulata, 242.
Scymnus *Australasiæ*, 243; *cucullifer*, 244; *inaffectatus*, 246; *jocosus*, 244; *pretiosus*, 246; *Queenslandicus*, 247; *sub-elongatulus* 245; *sublatus*, 246; *Sydneyensis*, 243;

Scymnus *vagans*, 248; *Victoriensis*, 245; *Whittonensis*, 247.
Seirotrana *major*, 228.
Selenurus *Sydneyanus*, 221; *variegatus*, 220.
Seranguim *hirtuosum*, 73; *maculigerum*, 73.
Settlement, its effects upon the Indigenous Vegetation, 195.
Sisyrium *fraternum*, 58; *laevigatum*, 60; *sparsum*, 60; stigmosum, 58; ventrale, 59; *vittatum*, 58.
Stethomela *caudata*, 237.
Stenopelmatidæ of Australia, 170.
Stenotheca rugosa, 183.
Stibaroma *trigramma*, 9.
Stigmodera Andersoni, 53; arborifera, 51; capucina, 218; *cara*, 216; *Dawsonensis*, 220; *canaliculata*, 51; *dispar*, 50; *equina*, 48; *filiformis*, 217; *ignea*, 219; *insignis*, 217; *hostilis*, 46; *longula*, 54; *Carpentariæ*, 153; *Macleayi*, 48; *marcida*, 52; Melbournensis, 53; *minuta*, 44; *ornata*, 53; *quadrinotata*, 49; *regia*, 218; *septemmaculata*, 45; *Skusei* 46; *sternalis*, 47.
Symmachis lacteipennis, 96.
Tachys *Yarrensis*, 20.
Tæniomena albosignata, 105; *Fraserensis*, 108; lobata, 107; *minor*, 109; soror, 106; *sororoides*, 106.
Tate, R., on New Species of Mollusca, 125 Supplement to a List of South Australian Mollusca, 133; on Cambrian Fossils of South Australia, 183; on Bittner's "Echiniden des Tertiars von Australien," 190.
Teispes *Frenchi*, 234.
Tepper, J. G. O., Gryllacridæ and Stenopelmatidæ of Australia and Polynesia, 137; Phaneropteridæ of Australia and Polynesia, 77.
Terebratulina cancellata, 136.
Termessa *xanthomelas*, 6.
Trichorcus cinctus, 73.
Tristaria *labralis*, 30.
Trogoderma Baldiense, 208; *Froggatti*, 34; *Reitteri* 207; *varipes*, 208.
Trox *Augustæ*, 39; *Elderi*, 37; *eremita*, 38 *Euclensis*, 39; *quadridens*, 38; *Tatei*, 37; *velutinus*, 40.
Tryphocharia *Frenchi*, 233; Mitchelli, 56.
Turbonilla *crenulifera*, 126.
Voluta *Verconis*, 125.
Wallabies of South Australia, List of, 18.
Xanthorhoe *hyperyihra*, 12; *paradelpha*, 11 *xanthopsila*, 13.
Xylorycta *leucophanes*, 17.
Zietz, A., List of South Australian Kangaroos, 18.

Vardon & Pritchard, Printers, Adelaide.

VEGETABLE EXUDATIONS.

By J. H. MAIDEN, F.L.S., F.C.S.,

Curator Technological Museum, Sydney, and Botanist Forest Department, Sydney.

PREFATORY NOTE.

The vegetable exudations brought home by the Expedition consist of:—

One Manna *(Myoporum platycarpum).*
Two Gums *(Acacia leiophylla* and *Brachychiton Gregorii).*
Three Kinos *(Eucalyptus tessellaris, E. incrassata,* and *E. incrassata, var.).*
Two Resins *(Callitris verrucosa* and *Xanthorrhœa Preissii).*

The gums, kinos, and resins present no remarkable features. The manna is, however, a more interesting substance, and although it has been collected hundreds of times, and has been often brought under the notice of Australian scientific men, yet no one appears to have ascertained its composition. It proves to consist almost entirely of mannite, and its composition is practically identical with that of the ordinary commercial manna of Europe obtained from *Fraxinus Ornus.* This is the first time a true manna has been announced from Australia, as the so-called Eucalyptus-mannas are composed of sugars other than mannite. It would now be interesting to examine some barks and other Australian vegetable products for mannite.

Myoporum-manna is a perfect substitute for its European namesake, and when freshly exuded its colour is not objectionable.

MANNA.

Myoporum platycarpum, *R. Br.*

N.O. *Myoporineæ:* "Sandal-wood."

Collected 29th September, 1891, at Camp 65. Clayey sand. Collector's note:—

"This gum *(sic)* was collected partly off a small tree 20 feet high, and four inches in diameter, and is the one on which I noticed gum (manna, *J. H. M.*) oozing out, and partly from under it. The tree had been bleeding profusely, and for a long time, as there was a great deal of decaying gum (manna) round the

trunk. I believe the cause of bleeding to be insect-bores, but had not sufficient time to examine it closely, as my camel was very restive. The taste is sweet as sugar."

In spite of its sweetness, Mr. Helms informs me, that the natives were not partial to it, preferring the gum of *Acacia leiophylla*; probably because of its laxative property, and not from any objection to its sweetness, inasmuch as the blacks eat lerp and Eucalyptus-mannas, honey stored by bees, and also suck the honey-laden flowers of certain plants. It will be remembered that Sir Thomas Mitchell offered sugar to an aboriginal child, who spat it out with every manifestation of disgust, but the blacks usually do so with any edible to which they are unaccustomed.

That other natives (at least those of western New South Wales) do eat of this manna is borne out by the following statement by the late K. H. Bennett, in Proc. Linn. Soc., N.S.W., VII., 351. It is well known that Mr. Bennett's knowledge of such matters was both extensive and accurate.

"During the hot summer months another and totally different looking substance exudes from the trunks and branches of some of these trees in large quantities. This substance when freshly exuding from the tree resembles a thick froth, either pure white, and resembling snow, or of a pink or rose colour. These exudations assume various forms, and become solidified by exposure to a certain extent to the air. Sometimes they are in lumps as large as a man's hand, and sometimes in the form of stalactites over a foot long, as large as an ordinary candle, and gradually tapering to a point This substance is of a highly saccharine nature, with a peculiar sickly sweetness; it melts in the mouth like ordinary sugar; the natives are very fond of it, and either eat it, or by dissolving it in water make a kind of drink."

The sample of manna collected by the Expedition at first sight resembles a brownish earthy substance, *e.g.*, a marly soil containing much lime. On closer examination it is seen to have a pinkish tinge, while selected portions are quite white or cream-coloured.* It is vesicular in structure, soft and friable, sweetish and almost gritty to the taste. Should a demand for it for medicinal purposes spring up, it could be obtained quite pale coloured and pure, and in considerable abundance, if it were systematically collected as is the product of *Fraxinus Ornus*.

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* In the district of Fowler Bay, the native name of the manna is "outeman," that of the sandal-wood "poolkerah;" according to Mrs. Richards the fresh manna is quite white, and is full of insects, but becomes discoloured with age.—Editor.

MICROSCOPICAL EXAMINATION.

When the manna is observed under a lens, slender, bright, radiating crystals are observed, principally in the hollows of the mass. When examined under the miscroscope, they are found to polarize in bright colours, principally blue, green, and purple. The crystals are rhombic prisms with brachypinacoid faces; these crystals extinguish parallel to the principal axis. When the mannite is removed, purified, and crystallized from water, transparent crystals are formed which do not polarize in colours, or only occasionally, and then very faintly.

CHEMICAL EXAMINATION.

If the manna be boiled in dilute alcohol, and filtered hot, the filtrate, on becoming cold, consolidates into a crystalline mass. If this be stirred with alcohol, filtered, and well washed with alcohol on the filter, the dark-coloured substances contained in the manna will be removed, and also a portion of the mannite. If the residue be now dried, then dissolved in water, and crystallized from that medium, the crystals may be purified by two or three crystallizations from water and alcohol. When thus purified, the crystalline substance only reduces alkaline copper-solution to the very slightest degree on boiling, although the manna itself reduces Fehling's solution very readily.

The manna melts at 158-9° C., while the purified mannite melts at 160-1° C. A specimen of mannite freshly prepared from *Fraxinus*-manna melted, at the same time and under precisely the same conditions, at 161° C.

ESTIMATION OF GLUCOSE.

Two grams of the manna were dissolved in water, made up to 200 cc. It required 174 cc. to reduce 10 cc. of Fehling's copper-solution (10 cc. = 0·05 gramme glucose). The manna therefore contains 2·87 per cent. of a glucose.

Two grams of the same manna were dissolved in water, boiled with dilute hydrochloric acid for half an hour, and then made up to 200 cc. This solution required 148 cc. to reduce 10 cc. of Fehling's solution = 3·38 per cent. of a glucose after inversion, consequently we have 3·38 − 2·87 = ·51 per cent. of a sugar or sugars other than a glucose.

ULTIMATE ANALYSIS OF THE CRYSTALLINE SUBSTANCE FOUND IN THE MANNA.

The substance was purified as much as possible *without* the aid of animal charcoal. It was repeatedly crystallised from water and alcohol, and was eventually obtained almost white. The crystals are anhydrous. Analyses made 20th July, 1892.

Taken for analysis, 6·326 grains.

6·326 grains gave 9·01 grains CO_2 and
4·30 grains H_2O.

$CO_2 = 9·01$	$= 2·457$ C	$= 38·84$ %	$= 3237$ C
$H_2O = 4·30$	$= ·478$ H	$= 7·556$ %	$= 7556$ H
Oxygen, by difference	$= 3·391$ O	$= 53·604$ %	$= 3350$ O
6·326		100·000	

From these figures we may consider the formula to be = $C_6H_{14}O_6$.

From this analysis, and determinations of melting point, crystalline form, &c., there is no doubt that the substance is mannite.

A second combustion of the mannite was made, the figures obtained confirming the previous result. They are given here:—

6·345 grains were taken for analysis.
6·345 grains gave 9·11 grains CO_2, and
4·316 grains H_2O.

$CO_2 = 9·110$	$= 2·485$ C	$= 39·16$ %	$= 326$ C
$H_2O = 4·316$	$= ·479$ H	$= 7·55$ %	$= 755$ H
Oxygen, by difference	$= 3·381$ O	$= 53·29$ %	$= 333$ O
6·345		100·00 %	

$= C_6H_{14}O_6$ (mannite).

MISCELLANEOUS.

The manna contains—

3·5 per cent of moisture,
1·1 " ash,

a portion of which was dirt, as the manna is somewhat impure, as already stated.

The manna contains no tannic acid; its contact with the bark and dark colour might lead one to expect at least a trace.

It only ferments in the slightest degree after two days' treatment with yeast.

QUANTITATIVE ANALYSIS OF THE MANNA (SUMMARY).

The manna was dissolved in water, filtered, alcohol and lead-acetate added, which precipitated a small portion of the substances in solution. After removing the lead by sulphuretted hydrogen, and evaporating to dryness, the residue was treated with boiling 90 per cent. alcohol; this was dried and weighed. In this way 89·65 per cent. of mannite was found.

We may therefore conclude that picked samples of the manna from *Myoporum platycarpum* contain from 85 to 90 per cent. of mannite.

From the above results the composition of the manna may thus be stated :—

Mannite	= 89·65
A glucose	= 2·87
Other sugars	= ·51
Moisture	= 3·50
Ash with sand	= 1·10
	97·63
Substances removed by lead-acetate, and loss	2·37
	100·00

GUMS.

Acacia leiophylla, *Benth.*

N.O. *Leguminosæ :* "Yanwilli" of the natives.

Collected 25th October, 1891, on clay soil at the Fraser Range. Height of shrubs, 4-10 feet.

Mr. Helms informs me that this gum is largely used for food by the natives, and so highly is it esteemed by them that they were unwilling to part with even a small quantity of it. In Western Australia it has been recorded to yield a useful gum. In an official report it is stated that it "is recommended by the medical faculty for its strengthening properties," though it has no more claim to that recommendation than many other wattle-gums have.

This gum is a perfect substitute for gum-arabic, and would be valuable if obtainable in large quantities. It is readily and entirely soluble in cold water. It would require sorting for the market, as even in the small sample received there are three qualities, portions being quite brown and almost opaque, while other portions are colourless-transparent and yellowish-transparent respectively. The gum strongly resembles many specimens of wattle-gums I have examined from the western parts of New South Wales, *i.e.*, from arid country; the wattle-gums of inferior solubility being obtained from the coast districts, with comparatively high rainfall.

The chemical composition of the present sample hardly differs from that of gum-arabic. It contains 13·2 per cent. of water, 1·1 per cent. of ash, which consists principally of calcium carbonate with a trace of sulphuric acid, but no phosphoric acid.

For an account of the composition of Australian Acacia-gums, see my paper, "The Chemistry and Commercial Possibilities of Wattle-gums," Pharm. Journ. [3], XX., 869; 980 (1890).

Brachychiton Gregorii, *F. v. M.*

N.O. *Sterculiaceæ :* "Kurrajong."

Sample 1.—Collected 13th September, 1891, at Camp 50, centre of the Victoria Desert. Granite formation.

Sample 2.—Collected 16th November, 1891, from trees on granite formation.

The properties and composition of this gum are identical with that of other gums from the same genus, and described fully in my paper, "Sterculia-gum : its similarities and dissimilarities to Tragacanth," Pharm. Journ. [3], XX., 381, to which the reader is referred. Briefly, the present sample resembles the runnings of a spermaceti candle. It is in vermiform and flaky pieces ; most of them are white, but some of them are stained yellow and brown.

KINOS.

Eucalyptus tessellaris, *F. v. M.*

N.O. *Myrtaceæ :* "Blood Gum."

Collected 15th August, 1891, at Camp 33, near Barrow Range. Sand on granite.

This kino has a sweetish odour, is of a burnt-sienna-brown colour in bulk, and, owing to its friable nature, it is in very small pieces. The powder is of a mahogany colour. It dissolves in boiling water, but deposits catechin on cooling. The solution (one gram to the litre) is turbid, and of a very pale orange-brown colour.

It was analysed 1st June, 1892*, with the following result:—

Tannic acid and catechin	88·35
Moisture	10·40
Ash	·50
Impurities (Ligneous matter, &c.)... ...	·75
	100·00

A determination of the tannic acid according to Löwenthal's process gave 68·5 per cent.

This kino belongs to my Turbid Group.† A description of a Queensland sample of kino of this species will be found in the paper referred to in the footnote. In comparing the two kinos (of *E. tessellaris*, p. 417 of paper quoted, and *E. terminalis*, p. 415), it will be observed how close is the similarity between *tessellaris-*

* In kinos it is always important to state the approximate dates of collection and analysis, as their composition alters with age.

† "The Examination of Kinos as an Aid in the Diagnosis of Eucalypts." Part III., The Turbid Group. J. H. Maiden in Proc. Linn. Soc., N.S.W. [2], VI., 389.

kino from the Barrow Range and the *terminalis*-kino. The appearances and the analyses are the closer now (July, 1892), as the *terminalis*-kino has aged nearly another year. This is a coincidence, yet there is nothing discordant in the two more varying results obtained from *tessellaris*: they simply show the amount of variation possible in two perfectly well authenticated kinos from the same species.

Eucalyptus incrassata, *Labill., var. a.*

N.O. *Myrtaceæ.*

Collected 1st October, 1891, at Camp 67. Clayey sand. Height of trees, 30 feet.

This kino belongs to my "Turbid Group." It is friable, and therefore in small pieces; it is of a dark sienna-brown colour, the powder being of a lighter tint. It is entirely soluble in hot water, but deposits catechin on cooling. When made up to one gram per litre, the liquid has a pale orange-brown colour, though with a rose tint.

Its composition, determined 7th June, 1892, is as follows:—

Tannic Acid and catechin ...	84·18
Moisture	14·70
Ash	·40
Impurities	·72
	100·00

Lowenthal's method gave a tannic acid equivalent of 44·5 per cent.

The kino of this species has not been previously examined.

Eucalyptus incrassata, *var. b.*

"Mallee."

40 feet high. Collected 22nd October, 1891, at Fraser Range, in clayey sand.

This kino is bright-looking, friable, and with a colour resembling that of common garnets. Colour of powder raw-sienna. It is wholly soluble in hot water, catechin being deposited on cooling. The liquid (one gram to the litre) is turbid, and of a light reddish-brown colour, inclining to a rose tint.

Its composition may be stated as follows:—

Tannic acid and catechin ...	84·64
Moisture	14·60
Ash	·20
Impurities	·56
	100·00

It was analysed 1st June, 1892.

Determination of tannic acid by Löwenthal's method, 47·5 per cent.

This kino belongs to my "Turbid Group;" and contains a medium amount of catechin.

RESINS.

Callitris verrucosa, *R. Br.*

N.O. *Coniferæ:* "Pine."

Sample 1.—Collected on sand-hills at various places in the Victoria Desert. No date. Collector's note:—"This is the resin of tree with cones like enclosed, and different to earlier collected specimens."

A transparent colourless resin, having externally the powdery appearance characteristic of resins of this genus. It is entirely soluble in alcohol, and readily powders. Its composition and appearance in no way differ from that of the sandarach of commerce, for which it is a perfect substitute. For further information in regard to our indigenous *Callitris*-resins, see my paper, entitled "Australian and Tasmanian Sandarach" (Proc. Roy. Soc., Tasmania, 1889). The following additional note in regard to this species may be given:—"The resin of *C. verrucosa* was used to make firm the union (after lashing) of the hard-wood head to the reed, in the making of reed-spears by the aboriginals of Victoria. The resin was called by them bij-jin-ne." ("Aboriginals of Victoria," Brough Smyth, I., 306).

Sample 2.—Collected 3rd July, 1891, amongst granite rocks at Camp 14. Collector's note:—"Up to 30 feet, diameter 15 in. at base, but running up very conical. From trees and ground. The resin runs."

Hardly differs in appearance and behaviour from the preceding sample.

Xanthorrhœa Preissii, *Endl.* (probably).

N.O. *Liliaceæ*: "Grass-tree"—"Gnora" of the natives.

Collected 18th September, 1891, at Camp 55, Victoria Desert. Notes by collector:—"Sand hills. The trees had been burnt, and large masses of the gum were collected around the base with sand blown in while in the semi-liquid state. Some were near 15 feet high, and 18 inches in diameter."

This resin is in largish pieces of a dark purple-brown colour; it is very impure from the admixture of sand and vegetable débris.

Alcohol dissolves out 36 per cent. of a dark, rich-coloured resin, having much the appearance and behaviour of that derived from *X. arborea* under similar treatment.

When burned, 47·3 per cent. is removed, leaving 52·7 per cent. of impurity, chiefly sand. Under the microscope is is interesting to observe that particles have become very much abraded on the edges, confirmatory, of course, of the sand having been wind-blown.

For further particulars in regard to *Xanthorrhœa*-resins, see my paper on "Grass-tree Gum," Proc. Linn. Soc., N.S.W. [2]. v. 430 (1890), which includes some notes on the resin of the species under present reference.

I desire to acknowledge the valuable assistance I have received from my laboratory assistant, Mr. Henry G. Smith, in the examination of these exudations.

LEPIDOPTERA.

By OSWALD B. LOWER.

Taking the collection as a whole, it is exceedingly poor, and adds but little to our entomological fauna. This is the more to be regretted, as the opportunity for traversing the same ground may never occur again. A remarkable feature in the collection is the inclusion of several world-wide species, notably, *Heliothis armiger*, Hübn., and *Nomophila noctuella*, Sch., showing how these introduced (?) species adapt themselves to different localities and conditions. Another noticeable feature is the paucity of Œcophoridæ in the collection. This family is represented in Australia by at least 2,000 species—I have 230 species in my own collection, collected within 20 miles of Adelaide—and to find only *three* representatives in the collection is, to say the least, perplexing. It will also be noticed that the date of appearance of *Trictena labyrinthica*, Don., is very much at variance with the usual time. Most of specimens emerge in and around Adelaide during April and May, whereas those from the Interior were captured during October, at which time I have never observed them. In commenting on the general condition of the specimens received, I may say that the whole are in very fair order and, with the exception of those described as new, are taken at various periods both at Parkside and Blackwood. The collection, if it does nothing else, shows the distribution of the various species ; but one would have thought to have seen more of the Western Australian forms. The season just closed has been a very poor one from an entomological point of view, so far as Adelaide and its environs are concerned, and considering the reports from the Interior, insect-life was probably at a premium during the progress of the Expedition.

The following comprise the species received :—

Heterocera.

SYNEMONIDÆ.

Synemon, *Doubleday*.

S. pyrrhoptera, *n. sp.* Only one specimen. A male of this fine species captured at Fraser Range, 14th October, 1891.

S. sophia, white *var.* One fine specimen. A female from Murchison district, February, 1892. This differs somewhat from the type, being more prominently marked with the white on the

underside, and one of the spots on the hindwing has an obscure whitish suffusion in it on the upperside. Otherwise the same as I take at Mount Lofty, S.A.

HEPIALIDÆ.

TRICTENA, *Meyrick.*

T. LABYRINTHICA, *Don.* Two male specimens at Fraser Range in October, 1891. As before mentioned, the time of capture is noticeable. (Also taken at Parkside).

ARCTIADÆ.

EARIAS, *Hübn.*

E. CHLORODES, *Meyr.* One female specimen. Cootanoorina, June. (Also taken at Parkside).

ANESTIA, *Meyr.*

A. OMBROPHANES, *Meyr.* One male from Victoria Desert in September. I think it is very probable that the female of this species is apterous, I have taken a good number, and have had several from various correspondents for identification; but have never seen a female.*

LIPARIDÆ.

TEARA, *Walker.*

T. EREBODES, *n. sp.* Seven specimens, all females, from Fraser Range, in October.

T. INTERRUPTA, *Walk.* One female specimen. Locality not given. (I have a male taken at Port Lincoln, S.A.).

DARALA, *Walker.*

D. MACROTA, *Meyr.* One fine male specimen of this species at Nilpena, in May.

D. OCHROPTERA, *n. sp.* One specimen. A male at Cootanoorina in June.

BOMBYCIDÆ.

DETOLINIA, —.

D. LANCEOLATA, *Walk.* Two specimens. One at Mount Squires, in August. One at Camp 10, June 28, 1891.

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* Since writing the above I have obtained a female specimen from Melbourne, bred from the egg, the larva of which feeds on lichen dust, usually found on old posts. The imago, as anticipated, is apterous. For this information I am indebted to Mr. Ernest Anderson, of Toorak, Victoria, who has bred the species. 19-9-'92.

Noctuina.

DASYPODIA, *Guenée.*

D. SELENOPHORA, *Guenée.* One specimen at Forest Range, October ; in bad condition.

AGROTIS, *Hübner.*

A. INFUSA, *Boisduval.* One male. Fraser Range, October 7, 1891.

ORTHOSIA, *Trim.*

O. LUCASII, *Butler.* Two specimens. One at Nilpena in May, one at Cootanoorina, in June.

O. TORTISIGNA, *Walker.* One specimen, Cootanoorina, in June.

O. SPODIAS, *Meyrick.* One specimen, Cootanoorina, in June.

PRAXIS.

P. MARMORINOPA, *Meyrick.* One specimen, Cootanoorina, in June.

HELIOTHIS, *Ochs.*

H. LEUCATMA, *Meyrick.* Three specimens at Mount Squires and Victoria Desert in August.

H. ARMIGER, *Hübner.* Two specimens, Mount Squires, 28th August.

Geometrina.

MONOCTENIADÆ.

NEARCHA, *Meyrick*

N. BUFFALARIA, *Gn.* One male specimen, Mount Squires in August.

SELIDOSEMIDÆ.

OSTEODES, *Gn.*

O. PROCURATA, *Walker.* One male specimen, Mount Sir Thomas, in July.

CHLENIAS, *Gn.*

C. ARIETARIA, *Gn.* Two specimens, male and female, from Nilpena in May, and Cootanoorina in June respectively.

PYRALIDINÆ.

NOMOPHILA, *Hübner.*

N. NOCTUELLA, *Schiff.* Three specimens, Mount Squires and Victoria Desert, in August and September. This species is almost cosmopolitan.

TRITÆA, *Meyr.*

T. USTALIS, *Walker.* Seven specimens (extreme varieties) at Nilpena and Cootanoorina, in May and June.

XEROSCOPA, *Meyr.*

X. PHILONEPHES, *Meyrick.* One specimen, Cavenagh Range, in July.

HELLULA, *Gn.*

H. UNDALIS, *Fabr.* One specimen, Cootanoorina, June, 1891.

Tortricina.

TORTRICIDÆ.

CAPUA, *Steph.*

C. MELANOCROCANA, *Meyrick.* One specimen, in May, at Nilpena.

ŒCOPHORIDÆ.

EULECHRIA, *Meyrick.*

E. ACHALINELLA, *Meyr.* One specimen. Mount Squires, August 29th.

CÆSYRA, *Meyrick.*

C. OCELLARIS, *Meyrick.* One specimen. Victoria Desert, September.

MACROBATHRA, *Meyr.*

M. ALTERNATELLA, *Walker.* One specimen. Victoria Desert, in September.

HYPONOMEUTIDÆ.

ENDROSIS.

E. LACTEELLA, *H. S. (?)* One specimen, in bad condition, which appears to be this species. Cootanoorina, June.

PTEROPHORIDÆ.

TRICHOPTILUS, *Wlsm.*

T. CENTETES, *Meyr.* Six examples, at Arcoeillina Well, in May, 1891.

DESCRIPTIONS OF NEW SPECIES.

SYNEMON PYRRHOPTERA, *spec. nov.*

Male, 44 mm. Head, antennæ, and thorax dark fuscous, antennæ annulated with white. Club whitish beneath. Palpi white beneath, infuscated above. Legs fuscous-whitish. Abdomen ochreous-fuscous, whitish beneath. Forewings elongate-triangular, costa moderately arched, hindmargin bowed; dark fuscous, very irregularly irrorated with lighter fuscous and whitish scales; a large dark fuscous patch in disc before one-half, above middle, beyond which is an oblique suffused streak of pale reddish, centred with whitish, from costa at one-half to before anal angle;

two pure white transverse spots beneath costa at two-thirds, upper one the larger; an obscurely-indicated transverse row of darker spots from apex to anal angle, nearly parallel to hindmargin; cilia fuscous, with whitish tips. Hindwings scarlet, markings black; a broad irregular hindmarginal fascia, narrower at anal angle, from one-half of costa to anal angle, enclosing two spots of ground-colour, one below apex, and one beyond and near anal angle, the last hardly separated from ground-colour, inner margin broadly ochreous fuscous, cilia as forewings. Underside dark-fuscous, basal area strongly suffused with ferruginous; on oblique irregular wedge-shape streak of scarlet from immediately beneath costa at one-half, reaching half across wing; six obscure ovate transverse whitish spots, suffusedly edged with reddish-orange from near beneath apex to half across wing. Hindwings as forewings, a scarlet spot in disc, another beneath apex, paler, a third immediately beneath first, a fourth immediately beyond, and a fifth below and between fourth and fifth.

A distinct species well-characterised by the hindwings. The one specimen is not in the best condition, so that the description is a little loosely drawn up. The female may possibly be brighter coloured. One specimen, Fraser Range, October 14, 1891.

TEARA EREBODES, *spec. nov.*

Female, 42-50 mm. Head, thorax, abdomen, and legs dark fuscous, hairs of thorax yellowish tinged, tolerably erect. Abdominal segments and anal tuft orange, more pronounced beneath. Antennæ ochreous. Forewings elongate, costa nearly straight, hindmargin obliquely rounded; uniform dark fuscous, minutely irrorated with paler; cilia fuscous, with a blackish line at base. Hindwings with hindmargin rounded, slightly paler than forewings. Underside as upperside.

Seven female specimens; Fraser Range, in October. It is just possible the male will be found to be much lighter coloured, as is usual with the *Teara*.

DARALA OCHROPTERA, *spec. nov.*

Male, 55 mm. Head, thorax, abdomen and legs pale whitish ochreous; thorax fuscous-tinged beneath. Abdominal segments fuscous. Antennæ white, pectinations about 12. Forewings triangular, costa slightly sinuate, hindmargin strongly rounded, rather oblique, pale whitish ochreous, with fuscous markings; a small fuscous basal patch, a curved thick line from beneath costa at one-fourth to inner margin at one-third, darker anteriorly; a blackish longitudinal ovate discal spot at one-third, and another, transverse, beyond it at about one-half, centred with whitish, both above middle; a narrow fuscous line from two-thirds of costa to

two-thirds inner margin, strongly curved outwardly near costa, and nearly straight from discal dot; a broad fuscous suffusion immediately beyond this, posteriorly strongly margined with darker, leaving a clearly-defined line of ground-colour between the two lines: cilia pale ochreous. Hindwings as forewings, with hindmargin rounded, strongly haired with fuscous towards base; a moderate quadrate patch of brown hairs indicating discal dot; faint indications of lines of forewings; a fuscous strongly-dentate line from one-third of costa to one-third inner margin: cilia as forewings. Underside colour and markings as forewings, first line absent. Hindwings with two discal dots sharply centred with whitish. Allied somewhat to *D. ocellata*, Walk.

One specimen; Cootanoorina, in June.

COLEOPTERA.

By REV. T. BLACKBURN, B.A.,

Hon. Curator for Entomology, S. Aust. Mus.

The *Coleoptera* collected by Mr. Helms in the interior of Australia comprise a considerable number of species previously undescribed. There are very few brightly-colored species among them, and most of the new ones are closely allied to well-known forms. It is probably hardly safe to generalise positively on the strength of this material, for although Mr. Helms' abilities as a collector of *Coleoptera* are beyond suspicion, the season in which the expedition happened to be made was so exceptionally dry, and therefore unfavorable for the work of collecting, that it seems hardly likely any large proportion was obtained of the *Coleoptera* that occur in the district traversed. The family most plentifully represented in specimens is the *Curculionidæ*, by far the largest part of the specimens appertaining to the sub-families *Leptopsinæ* and *Amycterinæ*. Next to the *Curculionidæ* in respect of numbers come the *Lamellicornes*, and of these more than half belong to the obscure and extensive genus *Heteronyx*. No other family can be said to be more than sparingly represented. The prevalent type in the *Coleoptera* of this collection is distinctly south and south-western. The most interesting insect collected is a *Scaritid*, for which I find it necessary to propose a new generic name, and which I propose to call, in honor of Sir Thomas Elder, *Trichocarenum Elderi*.

CICINDELIDÆ.

TETRACHA.

T. Helmsi, sp. nov. Subtus piceo-brunnea, apicem versus testacea; supra viridis plus minusve purpureo-micans, mandibulis (apice excepto) labro palpis antennis pedibus et elytrorum apice testaceis; elytris antice fortiter minus crebre punctulatis postice lævigatis. Long., $6\frac{1}{2}$—8 l.; lat., $2\frac{4}{5}$—$3\frac{1}{5}$ l.

Very like *T. australis*, Chaud., but smaller, less nitid, with the testaceous apex of the elytra much smaller, the underside differently colored, the row of large punctures on the elytra near the suture scarcely marked, and the elytral puncturation considerably more sparse.

W. Australia; Murchison district.

T. pulchra, Brown. Lake Lefroy.

CARABIDÆ.

GIGADEMA.

G. eremita, sp. nov. Sat breve, sat latum ; nitidum ; aterrimum antennis apicem versus fulvo-pubescentibus ; capite magno pone oculos minus constricto, labro minus elongato sparsissime punctulato ; prothorace quam longiori (maris fere tribus partibus, feminæ minus quam duabus partibus) latiori, canaliculato, disco transversim strigato vix punctulato, partibus ceteris fortiter sat crebre punctulatis, angulis anticis rotundatis partem interjacentem sinuato-truncatam (maris sat fortiter, feminæ vix manifeste) superantibus, lateribus crenulatis fortiter rotundatis mox ante basin oblique fere rectis, basi late emarginata ; elytris striatis, interstitiis parum convexis puncturis sat magnis biseriatim sat crebre ornatis; femoribus anticis subtus ad basin angulatim dilatatis ; ligula in medio longitudinaliter planata, parte planata utrinque carinata (carinis retrorsum conver gentibus). Long., 16—18 l. ; lat., 6 l.

The comparatively short wide form, the large head, and the deep coal-black colour of this species associate it with *G. Bostocki*, Cast., from which it may be at once separated by its much stouter and less-finely pointed mandibles, by its shorter labrum, and the very different sculpture of its elytra, the interstices of which are less flat and much more closely and evenly punctured; the punctures running (as in *Bostocki)* in two well-defined isolated rows down each interstice (except close to the margin, where they become more confused), but being very much stronger, and more closely and evenly placed in the rows. It is very likely to be the insect mentioned by Dr. Gestro (Ann. Mus. Gen., 1875, p. 28) as having been, in his opinion, mistaken by the Baron de Chaudoir for *G. Bostocki*.

The sexual differences in this species are very peculiar. I do not think there is any room for doubting that the two examples before me are conspecific, nor, of course, can I doubt that the example with the anterior tarsi subdilated and clothed beneath is the male. The other example, however, is the smaller one, and it has the narrower prothorax, the middle part of the front of which is more prominent than it is in the male. I notice that the apical dorsal segment in the male is obsoletely notched behind.

From *G. longipenne*, Germ., this species may be at once distinguished by, *inter alia*, its larger head, shorter labrum, ligula longitudinally flattened and carinate, shorter and broader form ; from *G. grande*, Macl., by the sides of its prothorax being crenulate and strongly sinuate behind ; from *G. titan* by its wider and

less parallel elytra, with interstices punctured in more regular rows.

Fraser Range.

G. mandibulare, sp. nov. Elongatum; parallelum; minus nitidum; piceo-nigrum, antennis apicem versus fulvo-pubescentibus; capite modico pone oculos modice angustato, labro sat elongato; prothorace quam longiori (feminæ dimidia parte, maris etiam magis) latiori, canaliculato, disco transversim strigato in medio lævigato, partibus ceteris punctulatis, angulis anticis rotundatis partem interjacentem sinuato-truncatam vix superantibus, lateribus crenulatis fortiter rotundatis mox ante basin oblique fere rectis, basi bisinuata; elytris striatis, interstitiis vix convexis minus fortiter sat crebre sat confuse punctulatis; femoribus anticis subtus ad basin angulatim dilatatis; ligula ut *G. eremitæ*.

Maris mandibulo sinistro perlongo falciformi, dextro multo breviori intus ante apicem dente magno armato.

Feminæ mandibulis brevioribus, dextro apicem versus haud dentato. Long., 17—22 l.; lat., $6\frac{1}{5}$—$6\frac{1}{2}$ l.

Distinct, *inter alia*, from *G. Bostocki* and *eremita* by its elongate parallel form and pitchy tone of colour; from *longipennis* by its very differently shaped ligula; from *grande*, Macl. (according to Mr. Bates' remarks on that species in E.M.M., Nov., 1891, though not according to Dr. Gestro's figure in Ann. Mus. Gen., 1875), by its prothorax not differing much in shape posteriorly from that of *titan*, *longipenne*, &c.; from *grande*, Macl. (as figured by Dr. Gestro), by its prothorax much less produced in front; from *titan*, Thoms. (according to Mr. Bates and to Queensland specimens in my collection which I have regarded as that species, but not according to Dr. Gestro's figure), by the very differently shaped mandibles of its male; from *intermedia*-Gestro, by its very elongate form; and from the other recognise ably described species of *Giyadema* by the central part of the disc, of its prothorax devoid of puncturation.

The two specimens described above, which I believe to be male and female of one species, present slight differences, which I regard as accidental variations. In the female the lævigate portion of the disc of the prothorax is considerably smaller than in the male, moderately close puncturation occupying all the surface except the central third part. In the female, moreover, the elytral interstices are more closely and confusedly punctured than in the male, each interstice bearing about four irregular rows of punctures; while in the male the puncturation in many places falls into three, or even only two, fairly-defined rows. The strongly bisinuate base of the prothorax seems to be a notable character, and no other species of the genus that I have seen has

mandibles like this; the sickle-shaped left mandible of the male being almost as long beyond the labrum as the maxillary palpus, and the right mandible bearing a very strong tooth about halfway between its apex and the front of the labrum.

Everard Range.

TRIGONOTHOPS.

T. flavofasciata, Chaud. Barrow Range.

PHILOPHLŒUS.

P pygmæus, sp. nov. Sat depressus; pubescens; ferrugineus; prothoracis disco abdominis lateribus et elytris fuscis, horum lateribus et vittis singulis dorsalibus (postice late interruptis et apicem versus in sutura conniventibus) testaceis; prothorace quam longiori fere duplo latiori, antice modice emarginato, postice obsolete lobato, ad latera utrinque 2-setoso, latitudine majori longe ante medium posita, lateribus antice sat rotundatis vix angulatis postice subsinuatim convergentibus, angulis posticis obtusis; elytris sat confertim sat subtiliter punctulatis, leviter striatis. Long., $2\frac{1}{2}$ l.; lat., $1\frac{1}{3}$ l.

Maris tarsorum intermediorum articulis nullis subtus squamuloso-papillatis.

The characters of the intermediate tarsi in the male associate this species with *P. luculentus*, Newm., &c., in the last section of the genus, but its style of markings resembles that in *P. australis*, Dej., and others in the first and second sections; it is very much smaller than any previously-described *Philophlœus*, in this respect resembling *Agonocheila*, but its facies and structure of palpi are those of a *Philophlœus*. The pattern on its elytra is much like that in *P. angulatus*, Chaud., but having the discal vittæ narrower and abbreviated in front, as well as widely interrupted behind. The puncturation of its elytra is evidently less fine and less close than in *P. angulatus*, Chaud., but is finer and closer than in *P. eucalypti*, Germ., or *australis*, Dej.

Fraser Range.

P. ornatus, sp. nov. Sat depressus; pubescens; ferrugineus; elytris fuscopiceis, lateribus sat late et vittis singulis (antice valde dilatatis) testaceis, his in quinta parte apicali deficientibus; prothorace quam longiori duplo latiori, antice sat emarginato, postice leviter lobato, ad latera utrinque circiter 5-setoso, latitudine majori paullo ante medium posita, lateribus sat rotundatis, angulis posticis fere nullis; elytris confertim subtiliter punctulatis, leviter striatis, interstitiis parum convexis. Long., 5 l.; lat., $2\frac{1}{3}$ l.

Maris tarsorum intermediorum articulo 1° apicem versus, 2° toto, 3° sparsissime, squamuloso-papillatis.

This species seems to hover between the first and second sections of the genus, the third joint of the intermediate tarsi of the male being nearly devoid of papillæ beneath, but not quite. If it be regarded as a member of the first section, the elytra bearing a pattern together with the fine close puncturation of the same, the number of prothoracic setæ and the normally-shaped sutural apex of the elytra will distinguish it from others of the section except *P. monticola*, Blackb., which *inter alia* has a less transverse prothorax, the hind angles of which are less rounded off. As a member of the second section this species would be distinguished by the same characters (disregarding the form of the sutural apex) from all others of the section except *P. puberulus*, Chaud., which is not really described by its author, but is only compared with *australis*, Dej. (and in one respect with *Eucalypti*, Germ.); but that species seems to have the prothorax narrower, and with hind angles less rounded off, and the elytral vittæ of very different shape.

In the present insect the prothorax scarcely differs from that of *P. laticollis*, Blackb., except in being more deeply emarginate in front. The discal vittæ of its elytra are so wide in front that they occupy the whole base except a little slight infuscation round the scutellum, and extend backwards gently narrowing to near the apex of the elytra, where they do not meet. The lateral pale margin of the elytra is exceptionally wide.

Victoria Desert.

TRICHOCARENUM (gen. nov.).

Eutomæ valde affinis; corpus passim setis longissimis gracilibus vestitum; caput supra oculum puncturis magnis 4 utrinque instructum; humeri nulli; elytra puncturis magnis in seriebus sinis (præter seriem marginalem) instructa; prosternum antice irregulariter, et femora antica subtus biseriatim confertim, crasse punctulata.

Apart from the characters mentioned above, I do not find any characters to distinguish this genus from *Eutoma*, but the differences specified appear to me so numerous and strongly marked, that it would be misleading to refer to *Eutoma* the insect on which I found this new genus. The four large punctures above each eye (which are placed longitudinally, and are separated from the eye by a very deep sulcus), the close series of large punctures arranged along both margins of the under surface of the front femora, and the strongly punctulate prosternum as well as the double row of large punctures running down each elytron (in addition to a very close row of large punctures in the lateral sulcus of both prothorax and elytra) will at once separate this genus from all scaritid genera heretofore characterised. On the

front tibiæ the external inferior ridges are placed much as in *Eutoma* or certain *Carena* (e.g., *anthracinum*, Macl.). The external ridge has about four distinct teeth above its large terminal one; the inferior ridge consists of about six teeth.

T. Elderi, sp. nov. Elongatum; nitidum; nigrum setis fulvis vestitum, antennis (articulis basalibus exceptis) brunneo-pubescentibus et setis brevibus vestitis; capite elytris latitudine æquali quam prothorax nonnihil angustiori; hoc quam longiori vix latiori; elytris quam prothorax plus quam duplo longioribus. Long., 11 l.; lat., $2\frac{1}{2}$ l.

At a casual glance the head seems to be about the same width as the prothorax, and the elytra narrower than either; by measurement the proportions are as given above. The frontal sulci are deep, nearly straight (behind their front angle), and divergent hindward, reaching well behind a line joining the hind margins of the eyes; they are connected behind by a distinct transverse sulcus. The orbits of the eyes are swollen behind, and the eyes do not project beyond them. The antennæ are filiform and moderately long and stout. The prothorax has a well-defined impressed dorsal line, and is impunctate, except in the lateral sulci, where there is a close-set row of punctures, each bearing a long erect seta; its surface is obsoletely wrinkled transversely; its front is nearly straight, the angles, however, projecting slightly forward; its sides are nearly straight from the front hindward (and slightly convergent) till they round off without a distinct angle into the base. The extreme basal part of the elytra is thickly pitted with large setiferous punctures, of which a row runs hindward nearly to the apex, about half-way between the suture and lateral margin and another row (reaching the apex) between the inner row and the lateral margin, which bears a close-set row of punctures; these latter are not setiferous, but it is possible the example before me is abraded; the general surface is almost lævigate. The legs are quite like those of a *Eutoma* except in being much clothed with setæ, and in the generic character mentioned above.

I have named this most interesting insect after Sir Thomas Elder.

Victoria Desert.

CARENUM.

C. rugatum, Blackb. Victoria Spring.

CALLISCAPTERUS.

C. speciosus, Sloane. Victoria Desert.

PLATYTHORAX.

P. transversicollis, Chaud. Upper Murchison River. (This species

was known to me only by description, but I feel no doubt of the correctness of my identification. The Baron de Chaudoir did not know the precise habitat of the type.)

PHILOSCAPHUS.

P. costalis, Macl. Upper Murchison River.

SCARAPHITES.

S. laticollis, Macl. Boorabin.

CLIVINA.

C. Australasiæ, Bohem. Murchison District.

C. Helmsi, sp. nov. Sat angusta ; sat cylindrica ; nitida ; subtus obscure ferruginea, supra picea, elytrorum lateribus suturaque rufescentibus, antennis palpis capite antice pedibusque testaceis ; capite inter oculos sat profunde longitudinaliter sulcato ; prothorace antrorsum sat angustato, postice utrinque lineatim impresso, quam latiori fere longiori ; elytris sat fortiter punctulato-striatis, striis apicem versus obsoletis, stria 4ª basi extrorsum contorta ; tibiis anticis externe dentibus 4 instructis, dente summo parvo, 2° sat magno, 3° sat gracili cylindrico (apice obtuso) ceteros longitudine superanti. Long., 3 l. ; lat., $\frac{4}{5}$ l.

This species may be placed in the "section" of M. Putzeys' "Revision Gen. des Clivinides" in which the author places *C. Australasiæ*. It is very distinct by the following characters in combination :—Head with an extremely strong longitudinal sulcus between the eyes, suture lateral margins and epipleuræ of elytra reddish testaceous, legs entirely testaceous with only the knees faintly infuscate.

Cootanoorina.

GNATHAPHANUS.

G. aridus, sp. nov. Sat nitidus ; niger vel piceus, ore palpis antennarum basi pedibus (nonnullis exemplis femoribus picescentibus) et corpore subtus (hoc piceo notato) rufis vel rufo-testaceis ; prothorace transverso antice quam postice vix angustiori, canaliculato, utrinque ad basin foveolato (foveis obscure punctulatis), lateribus rotundatis, angulis posticis rotundatis ; elytris profunde striatis, interstitiis fortiter convexis, 3° 5° 7° que (hoc postice solum) puncturis seriatim ornatis ; mento haud distincte dentato. Long., 4—5 l. ; lat., $1\frac{3}{5}$—$1\frac{4}{5}$ l.

A very distinct species ; its mentum without a distinct median tooth, together with elytra bearing three rows of punctures, will

distinguish it from all the hitherto described Australian *Gnathaphani*.

Everard Range, &c.

G. Adelaidæ, Cast. Nilpena, &c.

SARTICUS.

S. obscurus, sp. nov. Sat robustus; nitidus; niger, antennis palpis pedibusque piceo-rufescentibus; prothorace leviter transverso, antice quam postice vix angustiori, leviter canaliculato, utrinque ad basin foveolato, lateribus et angulis posticis rotundatis; elytris elongato-ovalibus, fortiter striatis, striis obscure crenulatis, interstitiis sat planis (3° punctures 3 seriatim ornatis); metasterno ad latera et segmentis ventralibus sat fortiter punctulatis. Long., $4\frac{1}{2}$ l.; lat., $1\frac{4}{5}$ l.

The small size of this *Sarticus* will distinguish it from all previously described, except *cycloderus*, Chaud., and *ischnus*, Chaud. Its general form will separate it from both the latter. Compared with *cycloderus* it is of more robust appearance, with elytra less narrowed in front, and consequently seeming more massive and parallel. *Ischnus* is described as "of more slender and elegant form than *cycloderus*," and its prothorax is said to be "much narrower behind" (the prothorax of the present species being if anything wider behind). From *cycloderus* this insect also differs by the presence of a row of three punctures on the third interstice of the elytra.

Everard Range.

S. brevicornis, sp. nov. Minus convexus; nitidus; niger, antennis apicem versus palpisque ferrugineis; prothorace quam longiori fere tertia parte latiori, postice quam antice fere angustiori, leviter canaliculato, utrinque ad basin foveolato, lateribus et angulis posticis fortiter rotundatis; elytris ovalibus, modice striatis, striis vix manifeste punctulatis (lateralibus subobsoletis), interstitiis sat planis (3° punctures 4—harum tribus anterioribus striam 3am tangentibus—ornato); metasterno ad latera vix manifeste punctulato; antennis gracilibus brevibus, prothoracis basin haud attingentibus; prothorace antice in medio vix manifeste marginato. Long., 8 l.; lat., 3 l.

Though this species has altogether the facies of *Sarticus*, its comparatively slender and short antennæ, and the anterior prothoracic margin almost failing in the middle distinguish it strongly from all its previously-described congeners. It should be placed near *S. Aubei*, Cast., although its elytral striæ are not quite so absolutely impunctate as in that species. Its prothorax is much like that of *S. discopunctatus*, Chaud., but with even

more strongly rounded and more narrowly margined sides. The head is a little narrower and more elongate than that of *S. discopunctatus*, and the seventh and eighth elytral striæ are much more distinct, though considerably fainter than the rest of the striæ. The punctures of the basal ventral segment are very well defined.

Everard Range.

PLATYNUS.

P. marginicollis, Macl. Nilpena; also Everard Range.

DYTISCIDÆ.

BIDESSUS.

B. bistrigatus, Clk. Most of the examples of this species differ from the type in having the fuscous markings on the elytra very sharply defined—consisting of two blotches placed one behind the other on the apical half of each elytron. In one example the two are united on each elytron into a single large blotch, which is perfectly black.

ANTIPORUS.

A. Gilberti, Clk. Upper Arkaringa.

NECTEROSOMA.

N. penicillatus, Clk. Everard Range.

LANCETES.

L. lanceolatus, Clk. Boorabin.

RHANTUS.

R. pulverosus, Steph. Nilpena, Barrow Range, &c.

COPELATUS.

C. lividus, Shp. Upper Arkaringa.

ERETES

E. australis, Er. Boorabin.

HYDROPHILIDÆ.

HYGROTROPHUS.

H. nutans, Macl. Everard Range.

HISTERIDÆ.

SAPRINUS

S. cyaneus, Fab. Widely distributed.

NITIDULIDÆ.

THALYCRODES.

T. (Thalycra) australis, Germ. Mount Squires.

DERMESTIDÆ.

DERMESTES.

D. cadaverinus, Fab. Widely distributed.

LAMELLICORNES.

ONTHOPHAGUS.

O. Murchisoni, sp. nov. Minus nitidus; niger, antennis rufo-piceis clava testacea, corpore subtus pedibusque setis fulvis sparsim vestitis; capite haud transversim carinato, postice obsolete punctulato, antice et in clypeo genisque transversim ruguloso, clypeo antice triangulariter emarginato; prothorace æquali vix manifeste punctulato; elytris leviter catenulato-striatis, interstitiis planis lævigatis; pygidio sparsim leviter nec subtiliter punctulatis; sternis latera versus sat fortiter punctulatis; tibiis anticis externe 4-dentatis.

Maris (?) tibiis anticis gracilibus, dentibus minus fortibus.

Feminæ (?) tibiis anticis minus gracilibus, dentibus fortioribus.

Long., $3\frac{4}{5}$—$4\frac{1}{5}$ l.; lat., $1\frac{9}{10}$—$2\frac{1}{5}$ l.

Extremely like *O. muticus*, Macl., differing from it chiefly by the well-defined triangular emargination of the front of the clypeus. There is no trace whatever of transverse carinæ on the head, and the prothorax (except under a high power) appears quite devoid of punctures. On either side of the prothorax there is a tubercle, but scarcely a fovea. The smaller examples have the front tibiæ more slender than the larger ones, and less strongly toothed; they are no doubt the males. *O. inermis*, Macl., also resembles the present insect, but it also differs in the front of the clypeus being entire, and moreover it is a more nitid species.

Murchison River.

TROX.

T. Castelnaui, Lansb. Various localities.

T. Elderi, Blackb. Victoria Desert.

T. euclensis, Blackb. Nilpena, &c.

T. Tatei, Blackb.(?*-gigas*, Har., var.)

LIPAROCHRUS.

L. rufus, sp. nov. Late ovalis; glaber; rufo-ferrugineus; nitidus; capite fortiter ruguloso; prothorace fortiter transverso, a basi ad apicem angustato, postice quam antice fere duplo latiori, in disco sparsius subtiliter (puncturis transversis) latera versus crebrius magis crasse punctulato, lateribus minus late deplanatis, angulis anticis modice productis parum acutis, posticis rotundatis, margine basali

integro; elytris striatis (vix geminatim), interstitiis sat planis maris (?) juxta strias utrinque subtiliter feminæ (?) minus subtiliter sat æqualiter punctulatis, lateribus crenulatis tibiis anticis externe dentibus acutis 3 armatis. Long., $3\frac{1}{2}$ l.; lat., 2 l.

The dark ferruginous red colour of this species seems to be constant. It is near *L. politulus*, Macl., but is a much wider insect, and shorter in comparison with its width, its prothorax more narrowed in front, and less strongly punctured, its front tibiæ more sharply dentate externally, &c. Compared with *L. geminatus*, Westw., apart from colour, it is a little more elongate, with the discal punctures of the prothorax differently shaped (each puncture being a short, deep transverse scratch), and the depressed lateral margins of that segment much narrower, and with the elytral striæ much less distinctly geminate, and the interstices evidently less flat. The colour, size, and geminate striation of the elytra, in combination with the nitid glabrous surface, will distinguish it from all its described congeners except *L. oblongus*, Har., which seems from its description and name to be a much more elongate insect.

Murchison District.

OCNODUS, *Burm.*

The following two species may be, I think, referred to this genus, which, however, does not seem to me very clearly characterised by its author, who, I should judge, had seen only the female. If I should be incorrect in this determination the species in question would have to be regarded as forming a new genus near *Ocnodus*. The principal discrepancy is in connection with Burmeister's statement that the club of the antennæ is "small." In the *male* before me the lamellæ of the club are longer than the preceding five joints of the antennæ together; in an example which I believe to be its female, they are scarcely shorter than the preceding five joints; in the other species (of which I have not seen a male) the lamellæ forming the club of the antennæ in the female are as long as the preceding four joints together. In a third species which I have described under the name *O. lugubris* (Proc. Linn. Soc., N.S.W., 1891, III.), the lamellæ of the female are as in the latter. The antennæ of all these insects, however, are extremely like those of *Mœchidius* in all respects, and as Burmeister calls the club in *Mœchidius*, "small," also, I presume, it is a mere question of what one means by "small."

The two species described below are extremely like each other, so like that I should hesitate to separate them if it were not for a complete difference in the relation *inter se* of the clypeus and

labrum in the one and the other species, analogous to the difference that distinguishes the third section of *Heteronyx* (in my revision of the genus Proc. Linn. Soc., N.S.W., 1889 and 1890) from the first section. In the first species described below *(O. spinicollis)* the suture between the clypeus and labrum is very strongly arched in an angular fashion, so that the summit of the labrum rises towards the level of the upper surface of the clypeus (though without very nearly reaching it), while in the other *(O. fallax)* the suture is much nearer being straight, so that the summit of the labrum is placed very much further below the level of the upper surface of the clypeus. In *O. lugubris*, Blackb., the structure of these parts is as in *O. fallax*.

The punctures of these insects are not, I think, truly squamigerous, though to a superficial glance they may appear so, but the bottom of each puncture, under a strong lens, appears to be unevenly convex, or to consist of a convexity or granule intersected by one or two fine striæ.

N.B.—Since writing the above I have determined to refer to *Ocnodus* a third species, for which I had intended proposing a new generic name. On full consideration, however, although I still think it probable that it may eventually be found desirable to separate it generically, I cannot overlook the possibility that further research may produce intermediate forms such as to prove the structural differences merely specific. This third species differs from the other two principally by the different relation to each other of the labrum and clypeus (in *O. spinicollis* and *fallax*, and also in *O. lugubris*, the perpendicular front face of the clypeus is much elongated, so that the distance from the front of upper surface of the clypeus to the mouth organs is very considerable, but in *O. ferrugineus* the front face of the clypeus is much shorter, the line of separation between the clypeus and labrum being almost as in *O. fallax)*, the vestiture of the under surface of the tarsi (consisting in *O. spinicollis* and *fallax* of a thick mass of setæ at the apex of each joint as specified by Burmeister in his generic diagnosis, while in *O. ferrugineus* this structure is much less strongly defined), and in the upper surface of the body of *O. ferrugineus* being somewhat closely sprinkled with short whitish recurved setæ, which are wanting in all its congeners except *O. decipiens*, Burm., the real type of the genus.

I may add that *O. spinicollis* and *fallax* differ from all the other species yet described by the absence of setæ in combination with sharp-produced hind angles of the prothorax, *O. lugubris* by the former character without the latter, and that *O. ferrugineus* may be at once distinguished from *O. decipiens*, Burm., by its much smaller size and non costate elytra.

O. spinicollis, sp. nov. Femina. Robustus; modice elongatus;

convexus; nitidus; subglaber; obscure piceus, antennis palpisque dilutioribus; capite (præsertim clypeo) crebre rugulose, prothorace paullo minus crebre haud rugulose, elytris crebre crasse vix squamose, pygidio (hoc planato fortiter carinato) crasse rugulose, corpore subtus fortiter nec crebre, punctulatis; puncturis vix manifeste squamigeris; clypeo antice sinuato-truncato, anguste reflexo-marginato, ante oculos vix dilatato; prothorace quam longiori fere duplo (postice quam antice perparum) latiori, lateribus leviter bisinuatis, margine antico late fortiter bisinuatim emarginato, basi late rotundatim lobata, angulis anticis acutis fortiter productis, posticis rectis (certo adspectu fortiter spiniformibus); elytris inæqualiter interrupte obsolete costatis; coxis posticis ad latera quam segmentum ventrale secundum haud longioribus; tibiis anticis extus 3-dentatis. Long., 5 l.; lat., $2\frac{2}{5}$ l.

Barrow Range.

O. fallax, sp. nov. A præcedenti differt statura majori, colore rufescenti, pygidio minus crebre punctulato, clypeo antice æqualiter rotundato a labro sutura fere recta diviso.

Maris pygidio convexo vix manifeste carinato, segmenti ventralis quarti margine postico in medio reflexo. Long., $5\frac{1}{4}$—6 l.; lat., $2\frac{1}{2}$—$3\frac{1}{5}$ l.

Murchison district.

O. ferrugineus, sp. nov. Ferrugineus, antennarum clava pallide flava; nitidus; fortiter punctulatus, puncturis singulis setulas singulas pallidas ferentibus; elytris haud costatis; clypeo antice subemarginato fere truncato, ad latera utrinque oblique truncato; tibiis anticis extus juxta apicem 2-dentatis. Long., $2\frac{4}{5}$ l.; lat., 1 l.

The prothorax is about half again as wide as long, strongly convex, and even above; at its widest behind the middle, the sides strongly rounded, the front (which is rather strongly emarginate, with sharp angles) considerably narrower than the base, the hind angles obtuse, but not rounded; the base moderately and widely lobed in the middle. The elytra are at their widest near the apex, where they are about a quarter wider than the prothorax; they are evidently wider at their base than the base (but not than the widest part) of the prothorax; the setæ of the elytra run in rows, the interstices being transversely rugulose.

Victoria Spring.

HETERONYX.

H. fulvohirtus, Blackb. Murchison River.

H. piceus, Blanch. Murchison River.

H. severus, sp. nov. Minus elongatus, sat convexus ; postice vix dilatatus ; sat nitidus ; obscure ferrugineus, antennis palpisque testaceis ; pilis brevibus sparsim vestitus ; capite confertim rugulose, prothorace fortiter vix crebre, elytris crebre sat fortiter subsquamose, pygidio (hoc capillis erectis vestito) obscure sat crasse, punctulatis ; clypeo brevi, antice late vix emarginato, ante oculos utrinque leviter prominulo sutura clypeali fortiter carinata ; prothorace quam longiori (et postice quam antice) circiter dimidio latiori, lateribus sat rotundatis ante medium vix subsinuatis, basi sat rotundata vix bisinuata, angulis anticis minus productis vix acutis, posticis rotundatis (superne visis certo adspectu subrectis) ; elytris haud striatis (stria suturali excepta), vix transversim rugulosis ; tibiis anticis extus fortiter acute 3-dentatis ; labro clypeum haud superanti ; antennis 9-articulatis ; coxis posticis ad latera quam metasternum fere dimidio brevioribus ; unguiculis subbifidis. Long., $4\frac{1}{5}$ l. ; lat., $2\frac{1}{5}$ l.

Var. colore sat pallide ferrugineo.

The apex of the basal piece of the claws is more sharply produced than in most species with appendiculate claws, but scarcely sufficiently so to entitle the claws to be called truly bifid. The emargination (distinct though slight) of the clypeus with other characters places this species in my tabulation (Proc. Linn. Soc. N.S.W. 1888, pp. 1328-31) beside *H. satelles*, Blackb., which, however, is a much smaller insect, with more coarsely punctured elytra, clypeal suture non-carinate, &c. Independently of the slight emargination of the clypeus, this species is much more really allied to *H. victoris*, Blackb., and *viator*, Blackb., from the former of which it differs *inter alia* by its prothorax being scarcely even bisinuate (in *victoris* the same is distinctly lobed) behind, while it differs from both by its less closely and less strongly punctulate elytra, its evidently wider clypeus, and its strongly carinate clypeal suture.

Murchison District.

H. alienus, sp. nov. Modice elongatus ; minus convexus ; postice vix dilatatus ; sat nitidus ; piceo-ferrugineus, antennis palpisque testaceis ; pilis sat elongatis vestitus ; clypeo crebre rugulose capite postice magis crasse minus crebre, prothorace fortiter sat sparsim, elytris pygidioque (hoc longitudinaliter carinato) fere ut prothorax, punctulatis ; clypeo brevi antice late emarginato, ante oculos minus dilatato, sutura clypeali carinata ; prothorace quam longiori (et postice quam antice) fere duplo latiori, lateribus fortiter rotundatis, basi leviter bisinuata, angulis anticis minus prominulis sat acutis, posticis rotundatis (superne visis certo adspectu sub-

rectis); elytris haud striatis, transversim manifeste rugulosis; tibiis anticis extus 3-dentatis; labro clypeum haud superanti, antennis 9-articulatis; coxis posticis ad latera quam metasternum multo brevioribus; unguiculis subbifidis. Long., $2\frac{4}{5}$ l.; lat., $1\frac{1}{2}$ l.

The claws are not unlike those of the preceding species, but their apical piece is shorter and more slender in proportion.

In the tabulation (Proc. Linn. Soc. N.S.W. 1888, pp. 1328-31) this species falls beside *H. darlingensis*, Blackb., from which its carinate clypeal suture, stronger elytral puncturation, &c., readily distinguish it. It is in some respects like the preceding species in miniature, but is very much more coarsely punctured throughout. Compared with *H. satelles*, Blackb., it is a less elongate, and much more coarsely sculptured insect.

Upper Murchison River.

H. lobatus, Blackb. Fraser Range.

H. fervidus, sp. nov. Modice elongatus; sat convexus; postice vix dilatatus; sat nitidus; ferrugineus, antennarum clava testacea; pilis brevibus adpressis et alteris elongatis erectis sat sparsim vestitus; capite crasse rugulose, prothorace dupliciter (subtiliter et crasse) minus crebre, elytris squamose sat leviter, pygidio sparsim vix fortiter, punctulatis; clypeo antice fortiter emarginato, ante oculos sat fortiter dilatato, sutura clypeali impressa angulata; prothorace quam longiori et postice quam antice fere duplo latiori, lateribus modice arcuatis, basi leviter bisinuata, angulis anticis minus prominulis minus acutis, posticis rotundatis; elytris obsolete inæqualiter substriatis hic illic transversim rugatis; tibiis anticis extus fortiter acute 3-dentatis; labro clypeum anguste fortiter superanti; antennis 8-articulatis; coxis posticis ad latera quam metasternum vix brevioribus; unguiculis appendiculatis. Long., $5—6\frac{1}{5}$ l.; lat., $2\frac{2}{5}—3\frac{1}{5}$ l.

The elytra are not genuinely striated, but their surface is in places longitudinally convex (in some examples more noticeably than in others) which gives some appearance of striation; the nearest approach to a defined stria is close to the suture.

This species belongs to the aggregate which I have called 'Group V.," and which falls in section III. of *Heteronyx*. The species of that group are tabulated in Proc. Linn. Soc., N.S.W., 1889, pp. 141-5. This species must be placed (in the tabulation) beside *H. nasutus*, Blackb., on p. 141; it is very nearly allied to *nasutus*, having an exactly similar clypeal structure and "trilobed outline;" but is a considerably larger insect, with its prothorax much more narrowed anteriorly; its elytra also differ in their puncturation being quite of the kind called "squamose'

(while in *nasutus* the elytral punctures are well defined and isolated), and in being pseudo-striate.

Murchison District.

H. decorus, sp. nov. Modice elongatus; minus convexus; postice vix dilatatus; sat nitidus; obscure ferrugineus, antennis palpisque dilutioribus; sparsim fulvo-pubescens; capite confertim rugulose, prothorace fortiter subcrebre, elytris squamose sat crebre nec subtiliter, pygidio fere ut prothorax, punctulatis; clypeo antice late leviter emarginato, ante oculos minus dilatato, sutura clypeali subtili leviter arcuata; prothorace quam longiori (et postice quam antice) plus quam dimidio latiori, lateribus modice arcuatis, basi vix bisinuata, angulis anticis minus prominulis sat acutis, posticis rotundatis; elytris vix obsolete substriatis (stria subsuturali leviter impressa), vix transversim rugatis; tibiis anticis extus fortiter minus acute 3-dentatis; labro clypeum leviter minus late superanti; antennis 8-articulatis; coxis posticis ad latera quam metasternum sat brevioribus; unguiculis appendiculatis. Long., $5\frac{3}{5}$ l.; lat., $2\frac{7}{10}$ l.

The sculpture of the elytra being deep and somewhat close has a rough appearance, but the roughness is not conspicuously transverse. This species belongs to the same group (V.) as the preceding two. In the tabulation (cited above) it falls beside *cygneus*, Blackb., and *Fraserensis*, Blackb., is closely related, differing from the former by its much larger size, the short basal point of its hind tarsi, &c., from the latter *inter alia* by the completely rounded-off hind angles of its prothorax. The relation to each other of clypeus and labrum are almost as in *Fraserensis*, but the part of the labrum visible as the middle lobe of the "trilobed outline" of the head is evidently narrower in proportion to the lateral lobes.

Murchison District.

H. Fraserensis, sp. nov. Minus elongatus, sat convexus; postice leviter dilatatus; subnitidus; ferrugineus; pilis subtilibus adpressis et nonnullis erectis sparsim vestitus; clypeo confertim rugulose, capite postice quam clypeus magis crasse paullo minus crebre, prothorace subsparsim, elytris squamose sat crebre sat fortiter, pygidio minus fortiter minus crebre, punctulatis; clypeo antice vix emarginato late fere truncato ante oculos extrorsum haud producto; prothorace quam longiori circiter dimidio (postice quam antice vix dimidio) latiori, lateribus leviter arcuatis, basi bisinuata vix lobata, angulis anticis acutis modice productis, posticis fere rectis vix retrorsum productis; elytris haud striatis vix transversim rugulosis; tibiis anticis extus fortiter acute 3-dent-

atis; labro clypeum sat late superanti; antennis 8-articulatis; coxis posticis ad latera quam metasternum parum brevioribus, quam segmentum ventrale secundum sat longioribus; unguiculis appendiculatis. Long., 5 l.; lat., $2\frac{1}{2}$ l.

This species belongs to my section III., group V., sub-group II. (vide Proc. Linn. Soc., N.S.W., 1889, tabulation pp. 141—145), and in the tabulation would fall alongside *H. cygneus*, from which it differs by its much larger size, darker colour, more coarsely punctulate elytra, and wider more robust build; on the underside the ventral segments are considerably more sparsely punctulate, especially in the middle; the basal joint of the hind tarsi is considerably shorter, scarcely exceeding half the length of the second joint.

Victoria Spring and Fraser Range.

H. cribriceps, sp. nov. Minus elongatus; sat convexus; postice vix dilatatus; subnitidus; piceo-ferrugineus, antennis palpisque vix dilutioribus; supra fere glaber; capite confertim rugulose, prothorace leviter vix crebre, elytris sparsius subfortiter vix squamose, pygidio subtilius sat crebre, punctulatis; clypeo antice vix obsolete emarginato, ante oculos vix dilatato, sutura clypeali obsoleta; prothorace quam longiori plus quam dimidio (postice quam antice vix dimidio) latiori, lateribus leviter arcuatis postice (superne visis) sinuatis basi vix bisinuata, angulis anticis modice productis minus acutis, posticis rotundatis (superne visis subrectis); elytris vix obsolete substriatis, leviter transversim rugulosis; tibiis anticis extus fortiter parum acute 3-dentatis; labro clypeum vix superanti; antennis 9-articulatis; coxis posticis ad latera quam metasternum parum brevioribus; unguiculis bifidis. Long., 4—$4\frac{1}{5}$ l.; lat., $2\frac{1}{5}$—$2\frac{2}{5}$ l.

The clypeus has a well-defined elevated margin all across its front, which is only very widely (and scarcely distinctly) emarginate.

This is one of the few species of *Heteronyx* which seem to to oscillate between Sections II. and III. in my arrangement of the genus, the labrum rising fully to the level of the clypeus, but scarcely protruding above it. However, as, from a certain point of view, the head has some feeble appearance of a "trilobed outline," or rather of its curved outline being narrowly bulged out in the middle, I think it is best placed in Section III.; and if so placed it will fall in Group VI., which is tabulated in Proc. Linn. Soc., N.S.W., 1889, pp. 426-8. In that tabulation its place will be beside *H. rotundifrons*, Blackb., to which it appears to me genuinely allied, although differing from it much by the close, even puncturation of its head, the much finer and feebler

puncturation in general, the well defined external hind angle of its hind coxæ, the presence of pseudo-striation on its elytra, &c.

Upper Murchison River.

H. siccus, sp. nov. Modice elongatus ; sat convexus ; postice leviter dilatatus ; subnitidus ; brunneo-ferrugineus, antennis palpisque testaceis ; supra pilis brevibus suberectis parum crebre vestitus ; clypeo confertim rugulose, capite postice sat crasse minus crebre, prothorace leviter sparsius nec subtiliter, elytris squamose sat crebre, pygidio fortius sat sparsim, punctulatis ; clypeo antice truncato, ante oculos haud dilatato, sutura clypeali distincta recta ; prothorace quam longiori fere duplo latiori, antice parum angustato, lateribus sat arcuatis postice (superne visis) vix subsinuatis, basi vix bisinuata, angulis anticis modice productis sat acutis, posticis rotundatis (superne visis subrectis) ; elytris haud striatis, transversim rugulosis ; tibiis anticis extus fortiter acute 3-dentatis ; labro clypeum late leviter superanti ; antennis 9-articulatis ; coxis posticis ad latera quam metasternum vix brevioribus ; unguiculis bifidis. Long., $3\frac{3}{5}$ l. ; lat., $1\frac{4}{5}$ l.

The raised margin of the clypeus is not continuous across the front. The "trilobed outline" of the head is very feebly developed, appearing as a slightly-trisinuate curve, the middle lobe not very much narrower than the lateral ones.

This species belongs to the group in which I have placed the preceding one, but its hind coxæ of about the same length as the metasternum refer it to a different part of the tabulation of that group. Its place is on page 426 (loc. cit.), beside *H. incola*, Blackb., from which it differs *inter alia* by the much-less close puncturation of its head behind the clypeal suture, and the form of the hind angles of its prothorax, which when viewed from above appear almost right angles, whereas in *H. incola*, they are quite rounded-off from all points of view.

Murchison District.

H. Helmsi, sp. nov. Minus elongatus ; sat convexus ; postice leviter dilatatus ; minus nitidus ; ferrugineus, antennis palpisque testaceis ; sparsim subtiliter pubescens ; capite confertim rugulose, prothorace confertim subtiliter, elytris confertim subtiliter squamose, pygidio subtilius minus crebre, punctulatis ; clypeo antice truncato, ante oculos extrorsum haud producto ; prothorace quam longiori plus quam dimidio (postice quam antice dimidio) latiori, lateribus sat arcuatis, basi fere æqualiter rotundata vix bisinuata, angulis anticis obtusis vix productis, posticis rotundato-obtusis ; elytris vix obsolete striatis ; tibiis anticis extus bidentatis ; labro clypeum late fortiter superanti ; antennis 9-articulatis ;

coxis posticis ad latera quam metasternum haud brevioribus, quam segmentum ventrale secundum multo longioribus; unguiculis appendiculatis, parte apicali quam basalis paullo breviori. Long., 4 l.; lat., $2\frac{1}{10}$ l.

This species belongs to the last group of *Heteronyx* (having labrum overtopping the plane of the clypeus, the antennæ 9-jointed, and the claws appendiculate). It belongs to that portion of the sub-group characterised as having the head and prothorax not densely clothed with long erect hairs, the hind coxæ not or little shorter than the metasternum, and the puncturation of the upper surface more or less close, fine, and even. In my tabulation of the species presenting these characters (Proc. Linn. Soc. N.S.W., 1889, pp. 665 and 666) it is a little difficult to make this insect fit satisfactorily, as it does not quite agree with "H. middle lobe of trilobed outline narrowest" or "HH. middle lobe widest," as the three lobes are about equal. As, however, the middle lobe in H. is *a good deal* narrower than the others, and in HH. not much wider than the others there will be no fear of confusing the present species with any of those under H., and it will be better to apportion it to HH. (p. 666), altering "wider" (line 6) into "not narrower," and then distinguishing it from *laminatus*, Blackb., by its front tibiæ having only two teeth externally.

Victoria Spring and Fraser Range.

H. furvus, sp. nov. Sat elongatus; sat convexus; postice dilatatus; sat nitidus; setis brevibus sat crebre vestitus; rubro-ferrugineus, antennis palpisque dilutioribus; capite crebre sat fortiter ruguloso; prothorace subtilius sat crebre, elytris subtiliter minus crebre, pygidio sparsim subtiliter, punctulatis; clypeo antice truncato ante oculos angulatim dilatato, sutura clypeali sat profunde impressa recta; prothorace quam longiori plus quam dimidio (postice quam antice dimidio) latiori, lateribus modice arcuatis, basi vix bisinuata, angulis anticis modice productis acutis, posticis rotundatis; elytris vix obsolete substriatis certo adspectu subtiliter granulatis; tibiis anticis extus dentibus magnis 2 et supra dente parvo armatis; labro clypeum late subfortiter superanti; antennis 9 articulatis; coxis posticis ad latera quam metasternum haud brevioribus; unguiculis appendiculatis. Long., $4\frac{4}{5}$ l.; lat., $2\frac{3}{10}$ l.

The raised margin of the clypeus is scarcely traceable in the middle of the front. The "trilobed outline" of the head is fairly well defined, the three lobes subequal.

This species belongs to the same group of *Heteronyx* as the preceding. In the tabulation *(loc. cit.)* its place is on p. 667

beside *collaris*, Blackb., with which, however, it has little real alliance, and from which it may be distinguished among many other characters by the basal joint of its hind tarsi being very much shorter than the second joint. Its real alliance is certainly with *agrestis*, Burm., *elongatus*, Blanch., &c., forming the aggregate "C." (at end of page 666) in my tabulation, from all of which it may be distinguished by its much less close punctuation. In the example before me the propygidium is entirely exposed, but I judge this to be the result of some artificial inflation.

Murchison District.

H. longulus, Blackb. ? The condition of this example forbids its its positive identification.

COLPOCHILA.

C. deceptor, Blackb. Mount Squires.

ISODON.

There is an example of this genus from the Murchison District. The nomenclature of the genus presents difficulties (owing to the insufficiency of the descriptions of the named species) which I have been unable to overcome.

PHYLLIOCEPHALA.

P. nigro-hirta, Blackb. Victoria Spring.

CRYPTODUS.

C. caviceps, Westw. Murchison District.

SEMANOPTERUS.

S. minor, Blackb. Murchison District.

BUPRESTIDÆ.

MELOBASIS.

M. Elderi, sp. nov. Tota æneo-virescens; sat nitida; subtus et in capite sparsim albido-pubescens; capite plano sat crebre sat fortiter subrugulose punctulato; prothorace quam longiori fere duplo (postice quam antice quarta parte) latiori, nullo modo canaliculato, ad basin in medio fovea impresso, sat fortiter sparsius (latera versus crebre) punctulato, lateribus fere rectis, margine antico sinuatim emarginato, basi bisinuata, angulis posticis sat acutis retrorsum directis; elytris vix striatis, inæqualiter (latera versus magis æqualiter) sat subtiliter seriatim punctulatis, interstitiis sparsim (quam series vix minus fortiter) punctulatis et hic illic obscure convexis; lateribus postice denticulatis; prosterno antice declivi; corpore subtus fortiter punctulato. Long., 6 l.; lat., $2\frac{1}{5}$ l.

An obscure looking species of greenish æneous colour, bearing much general resemblance to *M. nervosa*, Boisd., but without the elytral costæ of that insect, and having the prothorax more transverse, with its sides straighter, and its greatest width *at* the base, &c.

Fraser Range.

M. sordida, Blackb. Fraser Range.

MERIMNA.

M. atrata, Hope. Victoria Desert.

NEOCURIS.

N. cærulans, Fairm. Fraser Range.

JULODIMORPHA.

J. Bakewelli, White. Murchison District.

STIGMODERA.

S. Burchelli, L. and G. Murchison District.

S. longicollis, Saund. Upper Murchison River.

S. hostilis, Blackb. Murchison District.

S. vittata, Saund. Victoria Desert.

S. atricollis, Saund. A short series of examples taken in the Victoria Desert seems to me to be referable to this species in spite of a degree of variation that to a casual glance certainly appears incompatible with such an identification. Scarcely two specimens in the series are quite alike. The extreme form measures only $3\frac{3}{4}$ l. in length, and the pale colouring on the elytra is whitish-yellow, the markings and sculpture being not much different from the typical form of *atricollis*, except in the apical black colouring of the elytra, and the post-median fascia being very wide. I think this form may perhaps be conveniently named, and I shall call it "var. *deserti*." The other examples are of varied size, up to 5 l. in length, and in all of them (except one, the largest) the three spots in front of the elytra are united into a fascia, which, however, does not reach the lateral margins. In some of them the oblique emargination at the sutural apex of the elytra is extremely reduced in size, but is never quite absent; the apical spine is well developed in all. The colour gradually through the series approaches that of typical *atricollis*. I have been much puzzled by this insect, and have been very unwilling to call it *atricollis*, but in spite of misgiving on the point, much careful study has failed to bring to light any constant character to distinguish it specifically.

S. Elderi, sp. nov. Modice elongata; minus depressa; fere glabra; flava, capite viridi macula magna flava ornato,

prothorace macula magna obscure viridi, elytris fasciis 2 altera antemediana latera haud attingenti prope latera antrorsum producta, altera postmediana integra ad latera retrorsum producta) parte apicali quinta et sutura a fascia antemediana retrorsum cyaneo-nigris, scutello cyaneo, prosterno ad basin metasterni et abdominis maculis nonnullis antennis pedibusque cyaneis; capite æquali sat fortiter punctulato; prothorace quam longiori (et postice quam antice) paullo plus quam tertia parte latiori, sat fortiter vix crebre (in medio paullo minus crebre minus fortiter) punctulato, antice leviter sinuatim emarginato, postice vix bisinuato, lateribus leviter arcuatis, angulis anticis subacutis posticis acute rectis; elytris punctulato-striatis, basi subrectis, apice singulatim fortiter trispinosis, lateribus postice haud denticulatis, interstitiis sparsim fortius punctulatis antice subplanis postice convexis, corpore subtus sparsim leviter (prosterno medio magis fortiter) punctulato. Long., $5\frac{1}{2}$ l.; lat., $1\frac{4}{5}$ l.

The dark mark on the prothorax occupies the greater part of the surface. Its shape may be roughly described as resembling that of the bust of a human figure with the head and the arms truncated, the neck reaching to the front margin of the segment. The part, on each elytron, of the antemedian fascia bears a remarkable resemblance to the shape of a boot standing on (but not quite reaching) the lateral margin.

The markings and colours of the undersurface are scarcely distinguishable from those of *S. octospilota*, Lap. The upper surface, however, is very differently marked from that of *octospilota*, the general form is more elongate and narrow, the head is not longitudinally sulcate, the two external (of the three) spines at the apex of each elytron are long and acute, &c., &c.

Victoria Desert.

AGRILUS.

A. hypoleucus, L. & G. Fraser Range.

ELATERIDÆ.

AGRYPNUS.

A. Mastersi, Macl. Murchison District.

MONOCREPIDIUS.

M. nitidulus, Cand. Fraser Range.

MACROMALOCERA.

M. sinuaticollis, Blackb. Nilpena, or thereabouts.

RHIPIDOCERIDÆ.

RHIPIDOCERA.

The collection contains a single female example (taken at Cootinarina) of this genus. I cannot satisfactorily identify it with any species known to me, but even if it be of an undescribed species it would be undesirable to found a new species on a female.

MALACODERMIDÆ.

HELCOGASTER.

A single example was taken at Mount Squires. It is not in satisfactory condition for determination.

DASYTES.

D. Squiresensis, sp. nov. Minus elongatus; sat dense griseo-pubescens; æneus, femorum apice et tibiis rufo-testaceis; sat crebre minus fortiter subrugulose punctulatus; antennis prothoracis basin vix attingentibus. Long., $1\frac{3}{5}$ — 2 l.; lat., $\frac{3}{5}$—$\frac{7}{10}$ l.

Maris antennis intus leviter serratis, segmento ventrali penultimo arcuatim emarginato.

Feminæ antennis minus serratis, articulis 6° 8° que quam 5^{us} 7^{us} 9^{us} que multo angustioribus, segmento ventrali penultimo simplici.

The colour is greenish-brassy; in some examples the base of the tarsi and some, or all, of joints 2-4 of the antennæ are red. I do not observe any character inconsistent with a place in *Dasytes*, unless it be that the tarsi are a little stouter and less elongate than in most species of the genus. Apart from size and colour, this insect bears a good deal of resemblance to *D. niger*, Fab. Compared with that species, the present one is somewhat less elongate and much more closely and strongly punctured.

Mount Squires.

D. Helmsi, sp. nov. A præcedente differt statura multo minore, pedibus antennisque totis nigris, maris segmento ventrali penultimo late subconcavo postice vix emarginato. Long., 1—$1\frac{1}{5}$ l.; lat., $\frac{1}{2}$ l. (vix).

This species is extremely like the preceding in miniature, but the differences specified above seem, I think, inconsistent with its being a mere variety.

D. nigricans, Hope. Victoria Spring and Fraser Range.

CLERIDÆ.

ZENITHICOLA.

Z. sosius, Chevr. Murchison District.

ELEALE.

E. Reichei, Spinola. The insect which I believe to be this species, and which I have seen from other localities in Western Australia, was taken by Mr. Helms at Mount Squires. I do not think I can be mistaken in my identification, although M. de Spinola does not refer to a character that certainly seems worthy of note, viz., the arrangement of the whitish hairs on the pro-thorax in the form of a fascia. In all other respects the specimen before me agrees well with the description. The insect seems to be extremely variable in size, the smallest I have seen being less than 3 l. long; the largest 6 l.

NECROBIA.

N. rufipes, De Geer. Everard Range.

BOSTRYCHIDÆ.

XYLOPERTHA.

X. vidua, Blackb. ? This species was described from a unique specimen taken near Port Lincoln. The example of *Xylopertha* taken by Mr. Helms at the Barrow Range appears not unlikely to be the corresponding female, and the original type a male. When I described *X. vidua*, I took it to be a female, on account of its not presenting any of the strong sexual characters that I found in the male of its ally, *X. mystica*; although it did not either agree satisfactorily with the *female* of *X. mystica* in sexual characters. The examination of this example from the Barrow Range (which agrees perfectly in sexual characters with the female of *X. mystica*, but in other characters seems very near to, if not conspecific with, the type of *X. vidua*) suggests a doubt as to the sex of the type of *X. vidua*. At any rate, it would not be safe to regard this specimen as distinct specifically without having both sexes of it, or of *X. vidua*, for examination.

BOSTRYCHUS.

B. jesuita, Fabr. Murchison District.

TENEBRIONIDÆ.

HOPATRUM.

H. Elderi sp. nov. Modice elongatum; modice convexum; vix nitidiusculum; piceo-nigrum, labro testaceo, antennis palpis pedibusque obscure ferrugineis; setis brevibus fulvis vestitum; capite minus lato, cum prothorace sat crebre ruguloso, lateribus ab oculis antrorsum divergentibus magis longe quam oculi cavernæ longitudo; prothorace quam longiori plane (postice quam antice haud plane) duplo latiori,

nullo modo canaliculato, antice profunde emarginato, postice fortiter bisinuato, latera versus late deplanato, latitudine majori ad basin posita, lateribus a basi ad apicem vix arcuatim (juxta apicem magis arcuatim) angustatis, angulis anticis acutis longe ultra oculos productis, posticis sat acutis manifeste retrorsum directis, elytris ad basin quam prothoracis basin haud latioribus, crebre subtiliter granulatis sat fortiter striatis, striis puncturis sat magnis instructis, interstitiis æqualibus antice sat planis postice leviter convexis; tibiis anticis gracilibus. Long., 5 l.; lat., $2\frac{2}{5}$ l.

The distinctive characters of this species seem to be, head narrow, the clypeus dilating (but only very gently) forward from the eyes for a greater distance than the distance from the front to the base of the ocular cavity (in most species of *Hopatrum* the sides of the clypeus are *strongly* dilated from the eye), base of prothorax not narrower than the base of the elytra, anterior tibiæ only gently dilated (very much less strongly than in the European *H. sabulosum*, L.).

Murchison District.

H. longicorne, sp. nov. Ovale; minus convexum; alatum; subnitidum; piceum, antennis pedibusque plus minusve rufescentibus; setis brevibus fulvis vestitum; capite minus lato, cum prothorace elytris que sat fortiter sat crebre nec rugulose punctulato, lateribus nullo modo angulatis; prothorace quam longiori tribus partibus (postice quam antice circiter dimidio) latiori nullo modo canaliculato, antice minus fortiter emarginato, postice bisinuato, lateribus vix explanatis sat arcuatis, latitudine majori paullo pone medium posita, angulis anticis vix productis, posticis sat acutis; elytris punctulato-striatis, interstitiis planis, humeris obliquis; antennis sat elongatis prothoracis basin attingentibus. Long., $3\frac{3}{5}$ l.; lat., $1\frac{4}{5}$ l.

It appears to me very doubtful whether I am justified in not proposing a new generic name for this insect which differs from *Hopatrum* in its comparatively long antennæ, and in the structure of its prothorax. Its antennæ and prothorax are, in fact, those of a *Cestrinus*. The head differs from the head of both *Hopatrum* and *Cestrinus* by the sides of the clypeus being dilated laterally only a little beyond the outline of the eyes. The elytral epipleuræ and tarsi are those of a *Hopatrum*. I do not think the species can be referred to any of the genera that have been described near *Hopatrum*. The anterior emargination of the clypeus is very deep.

Fraser Range.

PLATYDEMA.

A female example of this genus was found at the Barrow Range. It does not seem to appertain to any described species, but it would not be well to describe it without having seen its male.

PTEROHELÆUS.

P. nitidiusculus, Macl. ? This species is known to me only by the description. The example taken by Mr. Helms at Victoria Spring is smaller than the type (long., 4⅕ l.), but otherwise agrees with Sir W. Macleay's description.

P. bullatus, Pasc. Nilpena, or thereabouts.

HELÆUS.

H. aridus, sp. nov. Late ovalis; subnitidus; glaber; niger, lateribus foliaceis vix rufescentibus, corpore subtus pedibus antennisque brunnescentibus; prothoracis lateribus foliaceis obsolete minus crebre granulatis, disco cornu valido conico armato; elytrorum disco sat crebre sat fortiter punctulato et granulis sat fortibus seriatim instructo, lateribus foliaceis haud punctulatis confuse sat fortiter granulatis, margine reflexo verticali obscure ruguloso; subtus elytrorum marginibus foliaceis minus crebre obsolete punctulatis. Long., 15½—16½ l.; lat., 9½—10½ l.

The granules on the elytra are variable; in some examples they form seven well-defined rows confused only near the front of the elytra, in others some of these rows are interrupted, in others they are confused with granules placed on the interstices, so that there seem to be a large number of ill-defined rows. The granules of the row next the suture on either side are very closely placed in front, where they form a quasi-costa. This species seems to me to be best distinguished by the perfectly vertical wide reflexed margin of both prothorax and elytra which is opaque, obscurely rugulose, and almost devoid of any continuous longitudinal furrow; viewed from the side it is seen to be of almost perfectly even width from the front angles of the prothorax almost to the apex of the elytra. A study of this external (more or less erect) margin of the prothorax and elytra appears to me to yield very valuable results in the determination of the species of the extremely difficult group which Sir W. Macleay made the first section of *Helæus*. The present species is also characterised by the quite strongly punctulate disc of its elytra in contrast with the impunctulate foliaceous margins. In some examples the apical ventral segment is much more acuminate behind than in others; probably this difference is sexual.

It is possible that this insect is identical with that which Sir W. Macleay regarded as *H. princeps*, Hope, but if so I am con-

vinced that Sir W. Macleay was mistaken in his identification of it. It is, I think, impossible that Mr. Hope could have described the species before me as having "six elevated punctured lines on the disc of each elytron."

Nilpena.

H. debilis, sp. nov. Late ovalis; nitidus; glaber; niger, corpore subtus pedibus antennisque brunnescentibus; prothoracis lateribus foliaceis sparsim distincte granulatis, disco cornu valido conico armato; elytrorum disco sparsim minus fortiter punctulato et granulis sat fortibus seriatim instructo, lateribus foliaceis obsoletissime punctulatis confuse sat fortiter granulatis, margine reflexo verticali vix ruguloso; subtus elytrorum marginibus foliaceis minus crebre obsolete punctulatis. Long., 13½ l.; lat., 9 l.

Very like the preceding, but considerably smaller and much more nitid, with the puncturation of the elytra manifestly finer and less close. The reflexed margin of the prothorax and elytra is evidently less elevated, so that viewed from the side it looks narrower; moreover that of the prothorax is very manifestly narrower than that of the elytra.

Exact habitat not specified, but from date of capture it extends from Arkaringa Valley to Everard Range.

H. lubricus, sp. nov. Late ovalis; nitidus; glaber; brunneus, abdomine piceo; prothoracis lateribus foliaceis leviter punctulatis disco cornu valido compresso armato; elytrorum disco minus crebre subtilius punctulato et granulis paucis seriatim instructo, lateribus foliaceis obsoletissime punctulatis confuse sat fortiter granulatis, margine reflexo decliviter inferiori (hoc prothoracis verticali longitudinaliter concavo); subtus elytrorum marginibus foliaceis crebre minus obsolete punctulatis. Long., 16 l.; lat., 10½ l.

Apart from colour-differences (which may not be constant) this species is much more nitid than either of the preceding two, and its elytra are punctured like those of *H. debilis;* the underside of the foliaceous margins (especially of the elytra) are very much less obsoletely punctured than in either of the preceding two; the reflexed margin of the prothorax is erect, but that of the elytra is inclined outward; looked at from the side, the reflexed margin of the prothorax narrows from the middle, both forward and hindward, and is continuously concave along all its length: while that of the elytra is strongly narrowed towards the apex (this appearance is caused by its becoming nearly horizontal behind), and is declivous in such fashion as to be somewhat underneath the elytra, its lower edge being quite sharply cariniform.

Murchison district.

H. ingens, sp. nov. Late ovalis; opacus; glaber, niger, corpore subtus pedibusque brunnescentibus; prothoracis lateribus foliaceis sparsim minute granulatis disco cornu valido conico armato; elytrorum disco confuse minus sparsim punctulato et obsoletissime quadricostato (costa externa quam cetere paulo fortiori et granulis conicis sat validis armata), sutura fortissime carinata, lateribus foliaceis sat crebre sat fortiter granulatis, margine reflexo fere verticali; subtus elytrorum marginibus foliaceis crebre obsolete punctulatis. Long., 14—15 l.; lat., 9—10 l.

An exceptionally opaque species. Viewed from the side, the reflexed margin of both prothorax and elytra appears vertical and very little rugulose, with the lower edge marked by a very strong longitudinal carina, as in *H. lubricus*. The strong convexity of the disc of the elytra and the comparative flatness of their foliaceous margins give this species a distinct appearance; owing to this, if it be viewed from the side, the upper outline of the reflexed margin seems almost to bisect the insect, so that the top of the elytra seems nearly as high above the said line as the metasternum is below it; while in all the preceding three species, if they be viewed similarly, the corresponding line seems very much higher, so that the top of the elytra is much nearer than the metasternum to it. Of previously-described species of this section of *Helæus* (*i.e.*, Section I. of Sir W. Macleay's Revision), *H. colossus*, De Brême, is the only non-nitid species having the elytral disc minutely and confusedly granulate; in that, however, the foliaceous margins of the elytra are marked with large scattered punctures, whereas in *H. opacus* they are strongly granulate. Although this species was not taken by the Elder Expedition, it seems convenient to describe it here as being a species from Central Australia closely allied to the preceding three.

Central Australia; McDonnell Ranges.

SARAGUS.

S. tricarinatus, sp. nov. Brevis; sat parallelus; minus convexus; minus nitidus; glaber; capite prothoraceque crebre minute punctulatis; hoc quam longiori (et postice quam antice) fere duplo latiori, a basi antrorsum arcuatim angustato, obsolete canaliculato, lateribus late explanatis, marginibus haud reflexis vix incrassatis; elytris obsolete sat crasse nec rugulose (nonnullis exemplis vix manifeste) punctulatis, acute tricostatis (sutura haud elevata), costis longe ante apicem abbreviatis, spatio suturali late depresso; tibiis anticis ad apicem extus haud dentiformibus. Long., 6 l.; lat., $3\frac{3}{5}$ l.

An extremely distinct species with a general resemblance to

S. emarginatus, Guèr., but with the elytra flat between the two carinæ nearest to the suture and the elytra parallel as in *S. convexicollis*, Macl. (which, however, is a very much larger and more elongate species).

Everard Range.

HYPAULAX.

H. orcus, Pasc. Fraser Range.

ADELIUM.

A. simplex, sp. nov. Elongatum ; minus nitidum ; supra æneum, subtus nigrum, tibiis apicem versus et tarsis totis læte fulvo-pubescentibus ; capite minus inæquali sat fortiter sat crebre nec rugulose punctulato ; prothorace quam longiori fere tribus partibus (postice quam antice tertia parte) latiori, vix canaliculato, haud ruguloso, subtiliter vix crebre punctulato et puncturis magnis paucis impresso, antice sat fortiter postice leviter emarginato, lateribus sat fortiter rotundatis sat explanatis pone medium haud sinuatis, angulis posticis obtusis ; elytris postice modice acuminatis, fortiter striatis, striis inæqualiter punctulatis, interstitiis convexis æqualibus, angulis humeralibus obtusis nec rotundatis, lateribus minus arcuatis ; antennis filiformibus sat elongatis, articulo 3° quam sequentes 2 conjuncti sublongiori. Long., $7\frac{3}{5}$ l. ; lat., 3 l.

An elongate but somewhat robust species, with elytra very little wider than the prothorax. The regular striation of the elytra, their evenly convex interstices and the comparatively slight inequality of the punctures in the striæ, are somewhat unusual characters. The interstices of the elytral striæ are punctured only very feebly and sparsely.

In M. Blessig's subdivision of *Adelium* this species would be associated with *A. caraboides*, Kirby, &c. ; but it does not seem to be very near any previously described species.

Victoria Desert.

CHALCOPTERUS.

C. cupripennis, Hope. Fraser Range.

C. eremita, sp. nov. Elongato ovalis ; viridis certo adspectu aureo- vel purpureo-micans, corpore subtus antennis pedibusque atris ; sat nitidus ; capite fere æqualiter punctulato, oculis modice approximatis, intus sulco sat angusto marginatis ; prothorace modice convexo, quam longiori (et postice quam antice) duabus partibus latiori, leviter inæqualiter punctulato, lateribus a basi antrorsum arcuatim convergentibus, margine antico leviter concavo, angulis anticis haud productis sat obtusis posticis (superne visis) obtusis ; elytris modice convexis, seriatim punctulatis, puncturis in seriebus

sat crebris sat subtilibus, interstitiis distincte sat crebre punctulatis ; prosterno inter coxas sulcato ; metasterno in medio sparsim subtiliter, ad latera et in episternis sat obsolete, punctulato ; abdomine subtilius minus crebre punctulato, sat fortiter (præsertim latera versus) longitudinaliter strigato ; antennis elongatis, articulis ultimis leviter incrassatis ; femoribus anticis antice sparsim subtiliter punctulatis ; tarsorum posticorum anticulo basali quam ceteri conjuncti vix breviori. Long., 5 l.; lat., $2\frac{3}{5}$ l.

The colour of the upper surface is somewhat uniform, but differs from different points of view, in some lights appearing a rich green, in others coppery, in others a mixture of the two, the suture in most examples being more or less golden. Viewed from the side, the upper outline appears evenly and only slightly arched (somewhat as in *C. fervens*, Germ., not strongly convex with the arch at its greatest height near the front of the elytra, as it is in *C. cupripennis*, Hope). The puncturation of the upper surface is much like that of *C. fervens ;* it differs from that of *C. cupripennis* by the stronger and less close seriate punctures of the elytra. The eyes are much more approximate than in either of the above-named species, and are margined within by a well-defined but narrow sulcus.

This species appears widely distributed in W. Australia, and the examples I have seen vary little except in size, and in some being a little more elongate than others. The largest example I have seen is $6\frac{1}{4}$ l. long.

W. Australia.

C. Meyricki, sp. nov. Elongato-ovalis ; modice nitidus ; capite prothoraceque cyaneo-viridibus, elytris obscure violaceis, corpore subtus cyaneo, antennis palpis pedibusque nigris ; capite sparsim subtiliter punctulato, oculis modice approximatis, intus sulco sat angusto marginatis ; prothorace sat convexo, quam longiori duabus partibus (postice quam antice etiam magis) latiori, vix manifeste punctulato, lateribus a basi antrorsum (superne visis) sat fortiter minus arcuatim convergentibus, margine antico vix concavo, angulis anticis obtusis nullo modo productis posticis (superne visis) obtusis ; elytris modice convexis, seriatim punctulatis, puncturis in seriebus sat remotis sat fortibus, interstitiis vix manifeste punctulatis ; prosterno medio inter coxas et antrorsum ad marginem anticum sulcato ; corpore subtus fere lævi ; antennis elongatis, articulis ultimis vix incrassatis ; femoribus anticis vix manifeste punctulatis ; tarsorum posticorum articulo basali quam ceteri conjuncti sat breviori. Long., 6 l.; lat., 3 l.

Resembles *C. eremita* in shape and in the structure of the eyes, but differs widely from it in other respects. The true margin of the prothorax is exceptionally strongly rounded, but although the true margin is not quite so bent down (it is more so than in *C. eremita)* as to be quite invisible from above, its strong curve is not apparent when the segment is viewed from above.

W. Australia; taken by E. Meyrick, Esq.

N.B.—A somewhat larger example (long., $6\frac{3}{4}$ l.), more attenuated behind, and having the puncturation of the underside a little less obsolete, and the colour a little more obscure, is probably the other sex of this species. It was taken on the Elder Expedition by Mr. Helms, in the Victoria Desert. I have founded this description on the example taken by Mr. Meyrick because I had already applied to it and used the name *C. Meyricki*, although no description has yet been published.

MORDELLIDÆ.

MORDELLA.

M. exilis, Germ.? Several specimens of the insect which I take to be this species were captured by Mr. Helms at the Fraser Range. I believe *M. exilis* to be very variable and widely distributed, but it is possible that some of the forms which I refer to it may prove to be good species. The examples from the Fraser Range are identical *inter se*, and are larger and differently coloured from the type. It will perhaps be advisable to give them a name even as a variety of *exilis*. This form might be characterised as follows:—

Var.? *obscurior*. Quam exemplum typicum major (long., 2—$2\frac{1}{3}$ l.), supra tota nigro-brunneo-pubescens.

I take this opportunity of characterising another insect which I hesitate to separate from *M. exilis* specifically, although to a casual glance it looks very distinct; but I have seen specimens that seem more or less intermediate.

Var.? *rufimanus*. Quam exemplum typicum major (long., $1\frac{1}{2}$—2 l.); supra læte pallide brunneo-pubescens, certo adspectu aurantiaco-micans; subtus argentea, certo adspectu aurantiaco-micans; capite antice femoribus anterioribus 4 et tibiis anticis rufis. Hab., S. Australia (Port Lincoln).

MELOIDÆ.

ZONITIS.

Z. Helmsi, sp. nov. Fusca, antennis tibiisque obscurioribus; capite elongato, crebre rugulose sat crasse punctulato, antennarum articulo 3° quam 2^us^ triplo longiori; prothorace sparsim minus fortiter punctulato; elytris pubescentibus, crebre minus fortiter sat crasse punctulatis. Long, $3\frac{1}{5}$ l.; lat., 1 l.

The antennæ are slightly more than half the length of the whole body (joint 1 about half as long as the space between the eyes is wide, 2 very short, the rest not differing much *inter se* in length). The head is a little longer than it is wide across the eyes, and about as long as the basal four joints of the antennæ together; the labrum a trifle longer than the clypeus, sulcate down the middle, its front part clothed with short hairs. The prothorax is slightly shorter than the head, about as long as wide (to a casual glance, longer), about as wide as the head, its sides parallel in their hind (and converging forward in their front) half, obscurely impressed on the disc, and deeply transversely near the front. In a certain light a faint luteous vitta seems to run down each elytron. The tibiæ are straight. The hind body is too much distorted for accurate description, but seems to be that of a male.

Not much like any previously-described species; perhaps nearest structurally to *Z. bipartita*, Fairm.

Murchison district.

CURCULIONIDÆ.

Brachyderini.

EVAS.

E. Everardensis, sp. nov. Nigra; squamis albis crassis sat dense vestita; rostro sat crasso, basi capite haud angustiori, antrorsum angustato, supra carinis flexuosis circiter 6 munito; antennis squamosis; prothorace sat cylindrico, quam latiori vix longiori, crebre tuberculato-ruguloso; elytris postice divaricatis acuminatis, leviter striatis, striis sat crasse punctulatis, interstitiis vix convexis confertim granulatis (exemplorum haud abrasorum sub squamas abditis), humeris breviter acutis, lateribus arcuatis. Long., $4\frac{1}{2}$—5 l.; lat., $1\frac{1}{5}$—$1\frac{3}{5}$ l.

Very distinct from the previously described species of the genus by its black colour and close vestiture (apparently very easily rubbed-off) of coarse white scales; also by the peculiar sculpture of its rostrum.

Everard Range.

E. crassirostris, Pasc. ? The example to which I apply this name comes too near Mr. Pascoe's description to be justifiably treated as a new species Mr. Pascoe, however, says that the prothorax in *crassirostris* is longer than wide. In the insect before me the prothorax appears so to a casual glance, but by careful measurement it is found to be, if anything, wider than long. The elytra are rather thickly clothed with very short inconspicuous curved setæ, which Mr. Pascoe does not mention in describing his insect, although in the description of

another *Evas (acuminata)* published at the same time he mentions the presence of three rows of such setæ on the elytra. West of Fraser Range.

Otiorhynchini.

PROXYRODES, gen. nov.

Rostrum crassum quam caput haud longius; scrobes apicales abbreviatæ, supra sat approximatæ; oculi subrotundati; antennæ longæ graciles, scapo arcuato prothoracem vix attingentis, funiculo 7-articulato; prothorax transversus, basi apiceque subtruncatus, lateribus arcuatis; scutellum modicum; elytra quam prothorax multo latiora; pedes modici; femora abrupte clavata et subtus dente acuto armata; corbuli postici aperti; tarsorum articulus secundus minus brevis; unguiculi liberi; metasternum minus breve; abdominis segmenta basalia 2 æqualia, 3° 4° que conjunctis quam 2^us^ vix longioribus, sutura prima fere recta; processus intercoxalis sat latus.

The dentate femora of this genus distinguishes it from all its Australian allies except *Proxyrus*, from which its slender antennæ, longer metasternum, &c., render it very distinct.

P. maculatus, sp. nov. Niger; squamis nigricantibus et nonnullis griseis intermixtis vestitus (his griseis caput pedes et corpus subtus tota tegentibus, in prothorace bivittatim positis, et in elytris limbum basin lateraque fimbriantem et maculas parvas numerosas quadratas in disco positas formantibus); rostro supra subtiliter 3-carinato, carinis externis antice divergentibus scrobes intus definientibus; antennarum funiculi articulis basalibus 2 elongatis, 1° quam 2^us^ vix longiori, ceteris inter se subæqualibus sat elongatis, 3° 4° que conjunctis quam 2^us^ fere brevioribus, clava quam articuli præcedentes 3 conjuncti vix breviori; prothorace transverso, antice truncato parum angustato, basi vix leviter bisinuata, lateribus modice arcuatis, angulis posticis (superne visis) acutis extrorsum directis; elytris pilis suberectis pallidis minus brevibus minus sparsim vestitis, punctulato-striatis, interstitiis sat planis, basi leviter bisinuata, humeris leviter extrorsum rotundato-prominulis. Long., 2—2$\frac{2}{5}$ l.; lat., $\frac{7}{10}$—$\frac{4}{5}$ l.

Everard Range.

IDASPORA.

I. terrea, Pasc.? An insect taken on the Fraser Range is certainly, I think, conspecific with the South Australian species to which I have doubtfully attributed this name, and concerning which a note of mine was published in Proc. Linn. Soc. N.S.W., 1892, p. 118.

Leptopsini.

So small a proportion of the Australian *Curculionidæ* have been described, that it is a very difficult, and perhaps not altogether a very desirable, thing to deal with small collections, such as that of the Elder Expedition, of isolated new species of that family. The difficulty is increased by the considerable amount of unsatisfactory work that has been already done by Mr. Pascoe, whose genera are most perplexing, being generally characterised either in a few words, mentioning a distinction from some other genus, or with an amount of detail that runs to the opposite extreme. Thus in the case of most of Mr. Pascoe's *Leptopsid* genera the comparative length and width of every joint in the antennæ is made a generic character, with the result that it is very seldom one can say of any species (unless it be the typical one of the genus) that it thoroughly agrees with the characters of any genus named by Mr. Pascoe. Until a great deal more work has been done with species, it appears to me that minute detail in generic characters is rather to be avoided, and that so long as their structural characters are sufficiently detailed in the specific descriptions, species are for the present best dealt with by being grouped in genera whose assigned characters are few, and unmistakeably salient.

Among the characters that have been most relied on as generic in the Australian *Leptopsini* are those founded upon the structure of the claws, which assume four different forms in the named genera—*(a)* two equal free claws to each tarsus, *(b)* two equal soldered claws, *(c)* two unequal claws, *(d)* a single claw to each tarsus. I may remark that my collection contains species having claws of still another type, viz., two claws on the front tarsi, and only one on each of the hinder four, and further that these different structures seem to pass so insensibly from one to the other in some intermediate species, that I cannot resist some doubt as to their value, or at any rate as to whether they will be very easily made use of when a large number of species have been described. All the four claw-structures enumerated above are represented in the *Leptopsini* of the Elder Expedition.

Other characters that have been relied upon as generic in the *Leptopsini* of Australia are found in the corbels of the hind tibiæ, the length of the antennal scape, the form of the eye, and the presence or absence of a scutellum, and apart from these characters one or two genera have been formed on exceptional peculiarities in other parts of the body.

All these latter characters seem to be of real value, and to deserve to be regarded as truly generic, and I am of opinion that for the present it is better to rely upon them chiefly for the

generic distribution of species. To add such trivial characters as Mr. Pascoe has done surely confuses instead of assisting, and would involve the creation of new and unstable genera in bewildering multitude.

With these preliminary remarks I proceed to enumerate the *Leptopsini* of the Elder Expedition.

ESSOLITHNA.

The essential characters of this genus, which are sufficient to distinguish it from all other described genera of Australian *Leptopsini*, are as follows: anterior coxæ contiguous, hind corbels open, eyes more or less rounded, a single claw on each tarsus. The following species presents all these characters, but does not agree with Mr. Pascoe's diagnosis of *Essolithna* in respect of some of the many minor characters attributed to the genus. Probably Mr. Pascoe would make it the type of a new genus allied to *Essolithna*. I, however, prefer to call it *Essolithna*.

E. seriata, sp. nov. Ovalis sat convexa; nigra antennis subferrugineis; squamis nigris et nonnullis aureis dense vestita, his in prothorace vittas 4 irregulares formantibus et in elytris in striis seriatim maculatim dispositis; setis brevissimis curvatis instructa; rostro brevi, antrorsum subdilatato, a capite sulco minus perspicuo diviso, postice longitudinaliter sat subtiliter canaliculato, parte antica dimidia lamellam atram glabram retrorsum angulatam (ut in gen. *Polyphradis* exemplis) formanti; antennis elytra vix attingentibus, sat robustis, pilosis, scapo oculum vix superanti, funiculi articulis inter se haud multo inæqualibus nullis transversis, 2° 6° 7° que quam ceteri paullo longioribus, clava quam articuli præcedentes 2 sublongiori; scrobibus profundis postice latis, margine inferiori deflexo; oculis late ovalibus infra paullo angustatis minus subtiliter granulatis; prothorace transverso, antice paullo angustato, tuberculis parvis umbilicatis crebre obsito, subtiliter canaliculato, lateribus fortiter rotundatis, lobis ocularibus angulatis ciliatis; scutello nullo; elytris prothorace fere dimidio latioribus plus quam duplo longioribus, punctulato-striatis, interstitiis sat planis, basi emarginatis, humeris rotundatis; femoribus prope apicem squamis pallidis annulatis; tibiis anticis intus minus perspicue denticulatis; segmentis ventralibus basalibus 2 elongatis (basali quam 2^{us} manifeste longiori, illo antice lato fere truncato), segmentis 3° 4° que conjunctis quam 2^{us} fere brevioribus, sutura prima leviter arcuata. Long., $2\frac{2}{5}$—$3\frac{1}{2}$ l.; lat., 1—$1\frac{1}{2}$ l.

The arrangement of bright golden scales among the general black vestiture at once separates this species from all allied forms known to me. In a well-marked example the golden scales are

as follows: on the head three vittæ and a sprinkling over the whole surface, on the prothorax four wide irregular and interrupted vittæ, on the elytra small patches in the striæ (here and there dilating on to the interstices) which give the appearance of numerous conspicuous golden yellow spots. The ring of pallid (scarcely golden) scales round the femora near their apex—it is interrupted on the inner face of the femora—is also a conspicuous character. I have, however, seen a single example in which the golden scales are nearly wanting (probably through abrasion), and this one is of an almost uniform deep opaque black colour. This species differs from the two previously described of the genus *inter alia* by the second joint of the funiculus slightly longer than the first joint,

West of Fraser Range; also in my collection from W.A. (exact locality unspecified).

POLYPHRADES.

P. tumidulus, sp. nov. Piceo-niger, pube ochraceo-grisea vestitus; rostro supra planato, utrinque ante oculum et supra scrobis partem posticam sulcato, antice lamella atra glabra parva munito, hac retrorsum ut carina abbreviata continua; antennis prothoracis basin vix attingentibus, funiculi articulo 1° quam 2^us^ fere duplo longiori, ceteris quam hic sat brevioribus inter se sat æqualibus, 3° fere (7° plane) transversis; scrobibus retrorsum dilatatis, margine superiori oculum medium versus directo, margine inferiori valde deflexo; oculis ovalibus infra sat angustatis, subtiliter granulatis; prothorace quam longiori duabus partibus (postice quam antice vix perspicue) latiori, sat crebre minus crasse ruguloso, nullo modo canaliculato, lateribus modice rotundatis, lobis ocularibus sat prominentibus sat latis; scutello haud perspicuo; elytris ad basin quam prothoracis basin vix latioribus, mox pone basin valde rotundato-ampliatis (hic quam ad basin dimidio, quam prothorax fere tertia parte, latioribus), hinc ad apicem æqualiter arcuato-angustatis, punctulato-striatis, interstitiis sat planis, angulis humeralibus dentiformibus; tibiis anticis intus denticulatis; unguiculis valde inæqualibus, denticulo interno vix perspicuo; segmentis ventralibus ut *Essolithnæ seriatæ*. Long., 3—4 l.; lat., $1\frac{2}{5}$—$1\frac{4}{5}$ l.

This species differs from all the *Polyphrades* known to me by the structure of its claws, which, to a casual glance, appear to be limited to a single claw on each tarsus, and this appears to be dentate near its base; but on careful examination this dentate appearance is seen to be caused by the presence of a very short second claw closely soldered to its fellow, except at its extreme apex, which projects as a minute tooth-like point. A further very

salient character consists in the remarkable rounded dilatation of the elytra immediately behind the base, causing the elytra to be suddenly swollen out (at a distance from the base equal to about a quarter of their whole length) to a very much greater width than their width at any other part. This elytral structure is less exaggerated in the small examples, which I take to be males, than in the larger ones.

Everard Range.

P. satelles, Blackb.? Among the *Curculionidæ* of the Elder Expedition are a number of large examples (from the Fraser Range, and places east of it) of *Polyphrades*, all of them so much abraded as to be unsuitable for description even if representatives of an undescribed species. I believe them, however, to be *P. satelles*, Blackb., which I characterised from examples taken in S.W. Australia. Mr. Pascoe has long ago (Tr. Ent. Soc., 1872) stated that the sexes of *Polyphrades* differ considerably in form, and in the relative proportions of the prothorax and elytra; and also that the males are subject to considerable *variation* in these respects. I believe this to be the case, and that in recognition of its being so, the examples I am discussing (although there is certainly no little variation of form among them) should probably all be regarded as conspecific; admitting, nevertheless, that the examination of specimens from which the pubescence had not been removed might possibly lead to a different opinion. The species bears no little resemblance to the common South Australian *P. longipennis*, Pasc., but is at once distinguished from it by the very evidently coarser sculpture of the prothorax, and by the different proportions of the joints in the funiculus of the antennæ. In *P. longipennis* the basal two joints are elongate, the second not much shorter than the first; while joints 3-7 are much shorter and subequal *inter se;* in *P. satelles* the second joint is not very much more than half as long as the first, and not much longer than the third. I may take this opportunity to remark that when I described *P. satelles* I called the second joint of the funiculus, as compared with the third, "vix longior," and that this phrase is scarcely correct, and represents the disparity between the joints as less than it really is, as the second joint is *distinctly* (though not much) longer than the third.

P. rugulosus, sp. nov. Piceus, squamis brunneo-fuscis confertim vestitus; rostro 5-carinato, antice lamella atra glabra munito; antennis prothoracis basin vix attingentibus, funiculo ut *P. tumiduli;* scrobibus oculisque ut *P. tumiduli* sed oculis vix tam subtiliter granulatis; prothorace quam longiori quarta parte (postice quam antice parum perspicue)

latiori, crasse vix profunde vermiculato-ruguloso, nullo modo canaliculato, lateribus leviter arcuatis, lobis ocularibus latissimis sat prominulis; scutello minuto; elytris sat elongatis, basi subtruncatis, punctulato-striatis, interstitiis convexis, humeris obtusis, sutura postice sat fortiter elevata; tibiis anticis intus denticulatis; unguiculis et segmentis ventralibus ut *Polyphradis* typici. Long., 7 l.; lat., $2\frac{1}{5}$ l.

A large and elongate but typical *Polyphrades*; distinguished by its uniform fuscous-brown vestiture, its elytral suture strongly elevated behind, and the very coarse vermiculate sculpture of its prothorax, which closely resembles the prothoracic sculpture of *Leptops tribulus*, Fab. The posterior declivity of the elytra is nearly perpendicular, and the outline of the elytra, viewed from the side, is gently sinuate in its declivous part.

W. of Fraser Range.

CHERRUS.

C. inconspicuus, sp. nov. Piceo-niger, squamis piceis dense vestitus, his nonnullis, albidis nonnullis cupreis variegatis; rostro cum capite fortiter sparsim punctulato; illo supra longitudinaliter leviter impresso vix perspicue carinato, antice lamella atra glabra triangulari munito; antennis sat elongatis, scapo oculos longe superantibus, funiculi articulis basalibus 2 elongatis inter se fere æqualibus, 3 multo breviori, ceteris quam 3^{us} paullo brevioribus nullo modo transversis; scrobibus ut *Polyphradis tumiduli*: oculis late ovalibus infra angustatis; prothorace (maris) quam longiori tertia parte (postice quam antice dimidio) latiori, crasse profunde (ut *Leptopis tribuli* subsimiliter sed magis crebre magis profunde) vermiculato-ruguloso, postice linea longitudinali minus perspicue impresso, lateribus sat arcuatis, lobis ocularibus minus validis; scutello punctiformi; elytris (maris) quam prothorax haud latioribus, basi conjunctim late leviter emarginatis (basi prothoracis basi subæquali), elongato-ovalibus, punctulato-striatis, striis 4^{a} 5^{a} que ante medium sat fortiter contortis, puncturis in striis sat magnis, interstitiis convexis, sutura postice haud carinata, angulis humeralibus acute dentiformibus extrorsum directis; tibiis anticis intus valde denticulatis; unguiculis ut *Cherri* typici. Long., 4 l.; lat., $1\frac{3}{5}$ l.

The coppery scales form some interrupted irregular vittæ on the head and rostrum, and some small ill-defined spots on the prothorax and elytra; the whitish scales are chiefly on the sides of the rostrum, head, prothorax, and metasternum, and along the top of the lateral declivous part of the elytra, form a ring round each of the femora, and are somewhat condensed about the apex

of the tibiæ; the apical part of the elytra is moderately strongly declivous (not very nearly perpendicular), and the upper outline of the elytra (viewed from the side) is an even curve (*i.e.*, from the scutellum to the apex there is no *sinuation* in the outline). No doubt near *C. aureolus*, Pasc., but *inter alia* with the joints of the antennal funiculus very differently proportioned.

W. of Fraser Range.

C. longulus, sp. nov. Elongatus; elytris opacis; piceo-niger, squamis nigris (dense) et setis pallidis (sparsim) vestibus; rostro cum capite crebre subtiliter nec profunde ruguloso; illo 5-carinato, antice lamella triangulari fere ut rostrum punctulata munito; antennis sat elongatis, scapo oculos sat longe superantibus, funiculi articulo basali quam 2^us^ fere duplo (hoc quam 3^us^ haud multo) longiori, articulis 3—7 sat elongatis inter se subæqualibus, clava elongata quam funiculo haud multo validiori; scrobibus ut *Polyphradis tumiduli*; prothorace quam longiori quarta parte (postice quam antice vix quinta parte) latiori haud canaliculato, leviter vermiculato-ruguloso (fere ut *Leptopis tribuli*, Fab., sed sculptura minus fortiter impressa), rugulositate pone marginem anticum obsoleta, lateribus sat rotundatis, lobis ocularibus minus validis; scutello punctiformi; elytris (maris?) quam prothorax vix latioribus, basi conjunctim vix emarginatis, elongato-ovalibus, punctulato-striatis, striis sat æqualibus, puncturis in striis modicis, interstitiis convexis, sutura postice haud carinata, angulis humeralibus distinctis vix acutis; tibiis anticis intus sat fortiter denticulatis; unguiculis ut *Cherri* typici. Long., 5 l.; lat., 2 l.

This species has much of the facies of a *Polyphrades*, but its antennæ are those of a *Cherrus*, the scape being long enough to impinge upon the prothorax when set back. It is a narrow elongate insect with a prothorax of somewhat globular appearance, and much more nitid than the elytra. The sculpture of the prothorax is very much like that of *Leptops tribulus*, but it becomes quite obsolete close to the front margin. The elytra are moderately strongly declivous behind, and the elytral outline viewed from the side is a nearly even curve, but is slightly sinuous close to the apex, owing to the apex itself being a little prominent hindward.

Murchison District.

C. maurulus, sp. nov. Præcedenti affinis sed minus elongatus, elytrorum lateribus multo magis rotundatis; supra sat depressus; colore et vestitu ut *C. longuli*: capite rostroque fere ut *C. longuli* sed rostro minus distincte 5-carinato, lamella antica magis nitida minus fortiter punctulata;

antennis paullo minus elongatis magis robustis, funiculi articulis 3-7 minus elongatis nec plane transversis; prothorace paullo magis transverso, crebre leviter (fere obsolete) granulato; elytris quam prothorax quarta parte latiori. Long., 5 l.; lat., $2\frac{1}{5}$ l. (vix).

In colour and vestiture very like the preceding but *inter alia* with the prothorax considerably narrower than the elytra and entirely differently sculptured, its sculpture resembling that of *Polyphrades longipennis*, Pasc. Like the preceding, this species has all the general appearance of a *Polyphrades*, but the scape of its antennæ reaching back considerably beyond the eyes places it in *Cherrus*. It is of the same sex (male) as the type of *C. longulus*. The outline of its elytra viewed from the side is an even curve.

Murchison District.

LEPTOPS.

L. biordinatus, sp. nov. Mas. Elongatus; sat angustus; niger, indumento sordide brunneo (præsertim in capite et in partibus excavatis) vestitus; rostro supra longitudinaliter concavo, 5-carinato, carinis 2° et 4° inter oculos retrorsum productis et hic abrupte desinentibus nec gradatim in capitis superficiem confusis, scrobibus postice latis male determinatis; prothorace quam longiori quinta parte (postice quam antice plus quam dimidio) latiori, crasse vermiculato-ruguloso, late leviter canaliculato (canalis fundo longitudinaliter carinato), antice profunde sinuato-emarginato, postice truncato, lateribus a basi ultra medium æqualiter leviter vix arcuatim divergentibus, angulis posticis fere rectis; elytris sat æqaliter cancellato-punctulatis, interstitiis 3° 7° que tuberculis conicis validis armatis (illo prope basin vix in tuberculis fracto), interstitio 5° plus minusve distincte costiformi, parte declivi summa tuberculo magno ad suturam instructo, humeris acutis antrorsum directis; prosterno antice tuberculo magno antrorsum directo utrinque armato et pone coxas tuberculo mediano bifido instructo; metasterni angulis posticis externis prominentibus; segmento ventrali apicali ad latera sulcato, parte mediana æqualiter convexa sparsissime punctulata; elytrorum interstitiis tuberculatis intermediis retrorsum leviter convergentibus. Long., 10—12 l.; lat., $3\frac{1}{5}$—4 l.

Femina. Multo latior, elytrorum tuberculis multo minus validis, interstitio 5° in medio obsolete tuberculato. Long., 15 l.; lat., 6 l.

This species may be roughly described as resembling *L. tribulus*, Fab., but with the intermediate carinæ of the rostrum (*i.e.*, those

between the middle one and the lateral ones) continued back on the head nearly to the level of the hind margin of the eyes and there ending abruptly—as in *L. colossus*, Pasc.—(instead of gradually merging into the general surface of the head about at the level of the front of the eyes), the rostral scrobes wide behind and not clearly defined, and the fifth interstice of each elytron in the male not at all tuberculate, and at most only very feebly carinate, and in the female appearing as a feeble or moderate carina tuberculiform only to the extent of being more or less broken about the middle of its length into detached pieces, which appear somewhat like very obtuse feebly raised tubercles; in many examples of the male the fifth interstice does not differ from the fourth and sixth. Closely compared with *L. tribulus* the rostrum is seen to be much stouter, the prothorax to be much more widely and less definedly canaliculate with the channel traversed longitudinally by a carina (which is wanting in *tribulus*), the two rows of tubercles next the suture (*i.e.*, one on either side of it) gently approximating hindward, the two tubercles adjoining (on either side) the suture a little in front of the apex less close to each other (although much nearer to each other than they would be if they were in the line of the tubercles on the third interstice), and the sterna very differently sculptured. The humeral angles of the elytra are acute and directed forward, while in *tribulus* they are rounded off.

The only other previously described species that this one seems to resemble at all closely is *L. Duboulayi*, Pasc. (from Champion Bay). I have not to my knowledge seen that insect, and the description of it is almost useless. With unaccountable oddity, Mr. Pascoe founded the species on the female, although he mentions having the male before him. He says that *Duboulayi* resembles *tribulus*, but differs by its prothoracic channel being of other form (deep in front and wide behind), and the third and fifth interstices of the elytra being tuberculate only in the hinder part, neither of which characters fits the present insect satisfactorily (especially if, as Mr. Pascoe implies, they distinguish both sexes). If this insect, moreover, were *Duboulayi* it seems impossible that Mr. Pascoe could have compared it with *tribulus*, and not have noticed the difference in the rostral carinæ, the stoutness of the rostrum, &c.

The tubercles on the elytra are of much the same size and shape as the corresponding tubercles in the same sex of *tribulus*.

Fraser Range; appears to be common.

L. raucus, sp. nov. Præcedenti *(L. biordinato)* affinis; differt elytris multo magis crasse sculpturatis (interstitio 5° etiam maris tuberculis distinctis nonnullis armatis, interstitiis 2° 4° 6° que vix continuis), forma magis convexa ad latera

magis arcuata, latitudine majori ad (vel fere pone) medium posita. Long. (maris), 13 l., (feminæ) 15 l.

This species resembles the preceding in the sculpture of its rostrum; the prothorax is almost similar, but is a little more dilated and rounded near the front, so that the sides appear slightly sinuate; the sterna and ventral segments are similar; but the general form and the elytral sculpture are so different that I feel compelled to treat it as more than a variety. In *biordinatus* the elytra are very parallel, and are at their widest distinctly in front of the middle; while in *raucus* they are decidedly more oval, and are at their widest *at* the middle in the male, and slightly *behind* the middle in the female. As regards the sculpture of the elytra, in *biordinatus* the non-tuberculate interstices are distinctly traceable as fine longitudinal lines, the spaces between them being somewhat feebly cancellate-punctulate, owing to the presence of series of transverse lines similar to those which form the interstices; all this sculpture, however, having a feeble and blurred appearance. In *raucus* no longitudinal interstices are distinctly marked, except the three tuberculate ones; the spaces between those three (and between the suture and the inner one) being occupied by strong irregular transverse lines, which in places run right across from the suture to the middle tuberculate carina, passing in a zigzag fashion between the tubercles of the first row; here and there two of these transverse lines are connected by a short oblique or longitudinal line, but not by anything like a *continuous* longitudinal line. The humeral angles are even sharper than in *biordinatus*, and in none of the examples of either sex before me of *raucus* do the tubercles of the first row coalesce in front into anything like a continuous carina

Barrow Range; also in my own collection from the neighbourhood of Eucla.

L. gravis, sp. nov. Elongato-ovalis; robustus; niger indumento griseo-brunneo vestitus; rostro supra longitudinaliter concavo, 5-carinato, carinis 2° et 4° gradatim in capitis superficiem confusis, scrobibus (fere ut *L. tribuli*, Fab.) sinuatis bene determinatis; prothorace quam longiori quinta parte (postice quam antice circiter dimidio) latiori, crassissime vermiculato-ruguloso, late canaliculato (canali antice in fovea magna paulo pone marginem anticum desinente), antice profunde sinuato-emarginato, lateribus superne visis sat rotundatis sed mox ante basin fere parallelis, angulis posticis rectis; elytris striis punctulatis 6 impressis puncturis fere foveiformibus sat crebre nec æqualiter in striis positis, interstitiis omnibus tuberculis crebris obtusis formatis, tuberculis in interstitiis 3° 5° 7° que quam in ceteris magis elevatis

(tuberculis in interstitio 3° antice plus minusve costam formantibus, in 3° 5° que postice et in 7° toto sat magnis sed parum acutis—fere ut *L. tribuli*, sed minus acutis—interstitio 1° paullo ante apicem fere ut *L. tribuli* tuberculo sat magno instructo), humeris breviter acutis antrorsum directis; sternis ut *L. biordinati*; segmento ventrali apicali ad latera sulcato, parte mediana sparsissime fortiter punctulato et longitudinaliter sat late sulcato; elytrorum interstitiis tertiis inter se parallelis.

Feminæ in elytris tuberculis minoribus magis obtusis. Long., 12—16 l.; lat., $4\frac{1}{3}$—6 l.

Nilpena; also in my collection from Lake Eyre basin and the McDonnell Ranges.

L. areolatus, sp. nov. Elongato-ovalis; robustus; ater, indumento pallide-brunneo vestitus (? in partibus concavis solis); capite fere ut *L. gravis* sed rostro supra haud concavo; prothorace fere ut *L. biordinati* sed paullo magis crebre minus crasse vermiculato-ruguloso, elytris in areolas irregulariter quadratas divisis, his 6-seriatim longitudinaliter dispositis, interstitio 3° postice tuberculis magnis circiter 4 instructo 5° in medio obtuse obsolete tuberculato, 7° toto tuberculis inæqualibus conicis instructo, tuberculis subsuturalibus nullis, humeris sat acutis vix antrorsum directis; sternis ut *L. biordinati*; segmento ventrali apicali fere ut *L. gravis* sed sulco mediano angusto; elytrorum interstitiis tertiis retrorsum leviter convergentibus. Long., 15 l.; lat., 6 l.

At once distinguishable from most of its allies by the total absence of the two approximate tubercles that are found in so many species near the summit of the posterior declivity of the elytra, one on either side of the suture. The tubercles on the elytra are all somewhat blunt and not very strongly raised, except the apical two or three of the third interstice, the apical one of the seventh interstice, and one at the junction of the third and seventh interstices, which are proportionally about as large as the corresponding tubercles in *L. tribulus* (male). The areolæ into which the elytra are divided are sharply cut and foveiform; they are many times wider and longer than the interstices that limit them; there are about twelve areolæ in the length of the front half of the elytra.

Barrow Range; unique.

L. planicollis, sp. nov. Elongato-ovalis; robustus; ater, indumento (exempli typici) fere nullo; capite ut *L. biordinati*; prothorace quam longiori fere tertia parte (postice quam antice fere duplo) latiori, sat crasse vermiculato-ruguloso, parte mediana tertia abrupte subcircullariter planato vel

leviter concavo, antice profunde emarginato, lateribus sat fortiter rotundatis mox ante basin fere parallelis, angulis posticis rectis; elytris obscure 6-seriatim cancellato-punctulatis, interstitio 3° longe ultra medium carinato pone medium tuberculis 2 vel 3 permagnis armato, interstitio 7° toto tuberculato (tuberculis apicem versus permagnis), interstitiis ceteris vix distinctis, parte inter carinas abrupte planata, humeris sat acutis antrorsum directis; sternis abdomineque ut *L. biordinati*; elytrorum interstitiis tertiis retrorsum leviter convergentibus. Long., 12 l.; lat., 4½ l.

I am not sure of the sex of the type of this remarkable species, but believe it to be a male. The species may be at once distinguished from all its allies by the perfectly flat median space of the prothorax and elytra (viewed from the side the upper outline appears as a perfectly continuous straight line from the front of the prothorax to the posterior declivity of the elytra), together with the fifth interstice being quite devoid of tubercles, and scarcely distinguished from the fourth and sixth interstices. Although not taken by the Elder Expedition, this species is sufficiently allied in its characters and habitat to the above to be suitably described here.

W. Australia; Eyre Sand-patch.

L. Interioris, sp. nov. Valde elongatus; minus convexus; dense murino-squamosus; rostro fere ut *L. gravis*, sed haud concavo; prothorace quam longiori (et postice quam antice) quarta parte latiori, vermiculato-ruguloso, anguste sat profunde canaliculato, paullo pone apicem transversim sulcato, antice profunde emarginato, postice vix bisinuato, lateribus leviter arcuatis, angulis posticis subrectis; elytris punctulato-striatis, puncturis in striis minus crebris, interstitiis sat latis, 3° 5° que leviter convexis postice in tuberculis minus elevatis fractis, interstitio 7° toto tuberculis parvis instructis, interstitio 1° (subsuturali) postice tuberculo modico instructo, humeris rotundatis; prosterno antice vix tuberculato pone coxas tuberculo bifido instructo; metasterno simplici; segmento ventrali apicali æqualiter convexo; elytrorum interstitiis tertiis retrorsum fortiter divergentibus. Long. 10—13 l.; lat., 3½—5 l.

Not much like any species of *Leptops* previously described, but resembling *Hopei*, Schönh., in its vestiture, though of a darker colour. The comparatively slender antennæ (with the scape exceptionally long) and legs, together with the elongate form, give it an aspect less robust than that of most of its congeners. The sculpture of the elytra is much like that of a female *L. tribulus*, and does not differ much sexually. From *L. tribulus* this species

differs by its much less robust and less convex form, the long slender antennæ, the smallness of the tubercles in the seventh elytral interstice, the almost complete disappearance of the tubercles on the front of the prosternum (which are not at all pointed forward), its rostrum not at all concave, even at the apex, &c. Very fresh examples of this insect have the elytra thinly clothed with short thick setæ of a bright golden colour, especially near the apex.

Nilpena ; also in my collection from the McDonnell Ranges.

L. contrarius, sp. nov. Ovalis; minus elongatus; niger, indumento (exempli typici) vix manifesto ; capite prothoraceque fere ut *L. biordinati*, sed scrobibus minus dilatatis; elytris æqualiter nec profunde cancellato-punctulatis, interstitiis 3° 5° que ad (vel fere ultra) medium anguste costatis (his postice et interstitio 7° toto tuberculis sat parvis instructis), interstitio 2° paullo ante apicem tuberculum modicum ferenti, humeris vix acutis haud antrorsum directis ; prosterno antice utrinque tuberculo acuto haud antrorsum directo et pone coxas tuberculo mediano bifido armato ; metasterni angulis posticis externis vix tumidulis ; segmento ventrali apicali sat crebre punctulato, utrinque impresso. Long., 11 l.; lat., $4\frac{1}{2}$ l.

I am not sure of the sex of the specimen on which this description is founded, but believe it to be female. The structure of the head and rostrum (the second and fourth carinæ of the rostrum ending abruptly between the eyes, the scrobes not expanded as in *L. biordinatus*, &c.) in itself distinguishes the insect from all the preceding species.

Barrier Range.

L. sulcicollis, sp. nov. Ovalis ; piceus, indumento sordide brunneo obscure vestitus ; rostro supra planato, 5-carinato, carinis 2° et 4° inter oculos retrorsum productis et hic abrupte desinentibus, carina mediana retrorsum vix minus quam 2^us^ 4^us^ que producta, scrobibus postice latis male determinatis ; prothorace quam longiori tertia parte (postice quam antice paullo magis) latiori, fortiter vermiculato-ruguloso, late profunde longitudinaliter sulcato (sulci fundo longitudinaliter carinato), antice profunde emarginato, postice truncato, lateribus a basi ultra medium sat recte divergentibus, angulis posticis rectis; elytris inæqualiter punctulato-striatis (puncturarum interstitiis rugulosis vix continuis), triseriatim tuberculatis, tuberculis conicis acutis, tuberculo parum elevato postice utrinque juxta suturam posito, seriei internæ tuberculis a basi retrorsum gradatim majoribus, serierum intermediæ et externæ tuberculis sat regularibus, hac longe

ultra elytrorum medium continua, illa medium vix superanti, humeris sat acutis haud antrorsum productis; prosterno antice utrinque tuberculo vix antrorsum directo et pone coxas tuberculo mediano bifido minus conspicuo, armato; metasterno utrinque postice subtuberculato; segmento ventrali apicali sat æqualiter convexo, subcrebre punctulato; elytrorum seriebus tuberculorum retrorsum leviter convergentibus. Long., 6 l.; lat., $2\frac{2}{3}$ l.

This species is at once distinguishable from all the preceding species of *Leptops* (apart from its diminutive size) by its having, like *L. tribulus*, three series of tubercles on each elytron, none of which become simple carinæ near the base. It resembles several of Schönherr's species of *Leptops*, from which it differs *inter alia* as follows:—From *dumosus* by the unusually elongate median carina of the rostrum, and by there not being on each elytron three exceptionally large tubercles placed triangularly; from *hystricosus* and *spinosus* by its wide, deep, and entire prothoracic channel; from *spiniger* by the absence of an isolated strong spine near the shoulders.

Interior of South Australia.

LAND AND FRESH-WATER MOLLUSCA.

By W T. BEDNALL,

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[Plate I.]

The number of species collected is seven—one fresh-water and six land-shells—namely, *Bulinus* (one), *Helix* (four), *Bulimus* (two). The number of living specimens obtained was fairly large, when the excessive drought which prevailed throughout the journey of the party is taken into consideration. The species of *Bulinus*, the only fresh-water-shell taken, occurred in a waterhole at a locality at which the party camped at the very commencement of the Expedition, is one that is widely distributed throughout the province of South Australia. Of the four *Helices* procured one proved to be identical with a species discovered by Professor Tate at Waukaringa some years ago, whose description of it is included in this paper. Another is *Helix perinflata*, described many years ago, but still a scarce shell in collections; while the remaining two are new species. The two species of *Bulimi* are both well-known West Australian forms.

Helix (Galaxias) perinflata, *Pfr.*

Pro. Zool. Soc., 1863; *Cox*, Monograph Australian Land Shells. (Pl. I, fig. 6.)

This shell was first obtained by Mr. F. G. Waterhouse in the MacDonnell Ranges, Central Australia, when accompanying John Macdougall Stuart in his exploration across the continent, and was described by Pfeiffer in 1863 from the specimens there procured. It was the prevailing species collected by Mr. Helms, and specimens were taken from Mount Illbillee on the Everard Range, westward to the Victoria Desert. Those taken at the commencement of the journey answer most closely to the description transferred by Dr. Cox to his Monograph of the Land Shells of Australia. A feature of these particular specimens is that some of them are encircled with a somewhat broad rufous band just above the periphery, which in very many of the examples has a tendency to spread towards the suture. In others again there is not the slightest semblance of the band of colour, and it is evidently specimens of this type that were submitted to Dr. Pfeiffer, as he makes no mention of this character.

Of a number of living and mature shells received by me some two years since some do and some do not exhibit the band.

This species varies a great deal, not so much in shape as in thickness, and again in coloration. The typical form is solid, but by far the greater number of the shells obtained during the expedition are comparatively thin, and appear to be identical with a race of this species which has extended southwards from the MacDonnell Ranges, and of which we have examples collected at Wilson and Carrieton. At one locality a dwarf form was taken very much in size and shape like *Helix Flindersi*, Adams and Angas, but without the colour-bands of that species. In coloration the shell varies considerably; some are a creamy-white, others have a faint interrupted cloudy-reddish band just above the periphery; in others this band becomes a most distinctive marking, while in very many the band extends from the periphery to the suture, being darkest in the centre. In the dwarf examples the shell is of a uniform greenish hue, with a shining vitreous appearance.

A description of the animal of *H. perinflata* from MacDonnell Range—specimens supplied by me, is given by Mr. Hedley in Proc. Roy. Soc., Queensland, vol. 6, p. 250, 1889.

The species was taken at the following localities :—

At the Everard Range on gneissic rock, at an elevation of 1,800 feet.

Mount Illbillee Soakage, Everard Range, under fig-trees, at an elevation of 2,000 feet. It was here that the dwarf specimens with the vitreous appearance were taken in company with one of the normal form.

Near Camp 4. Amongst spinifex, on sandy soil with lime outcrop.

Twenty miles south-east of Camp 4. Under spinifex.

Between Everard and Birksgate Ranges.

Near Camp 8. Under fig-trees, on granite rock.

Near Camp 10. In debris, under fig-trees, on granite rock.

Camp 14. Under granite rocks.

Birksgate Range. Amongst granite boulders under fig-trees.

Skirmish Hill. One dead specimen. On porphyrytic rock.

Cavenagh Range.

Near large clay-pan. About three miles south of Camp 58, Victoria Desert.

Between Fraser Range and Yilgarn Goldfield.

Helix (Hadra) fodinalis, *Tate*.

(Pl. I, figs. 1*a*—1*c*.)

Shell moderately umbilicated, globosely conic, rather thin and somewhat glossy; surface coarsely- and closely-wrinkled trans-

versely, somewhat closely and finely incised-striate in a spiral direction.

Whorls four and a half, regularly convex, separated by a linear suture ; first two and a half whorls almost smooth, but minutely granulated and obsoletely wrinkled ; the granulations disappear, and the wrinkles increase in strength and closeness with the revolution of the spire.

Last whorl somewhat inflated, slightly descending in front, base convex to the umbilical margin. Umbilicus moderately wide with precipitous sides, and towards the inner lip subangulated.

Aperture oblique, subcircular ; peristome subacute, slightly reflected, margins not joined by a callus. Columella-margin dilated above and slightly extending over the umbilicus.

Colour, a pale-brown above, paler beneath, sometimes with a narrow reddish-brown infuscation in front of the suture.

Animal :—Foot of a chestnut colour with grey rugosities, broad and short behind ; eye-pedicels of a blackish and tentacles of a chesnut colour ; collar milk-white.

Dimensions :—Major and minor diameters, 18 mm. and 15 mm.; altitude, 14·25 mm.; height of aperture, 10 mm.; length of aperture, 9 mm.; diameters of umbilicus, 3 and 3·5 (vix.) mm.

Affinities and Differences :—The nearest ally of this species is *H. Nullarborica*, mihi, from which it differs in the absence of an impressed suture , finer and closer spiral striæ, larger umbilicus, as well as by coloration and thinness of test ; it is related to *H. Angasiana*, Pfeiffer, but has more regularly convex whorls, coarser growth-lines, less-rotund and not so descending aperture, less thickened and reflected peristome. *H. bitaeniata*, Cox, is a more distant alliance, from which it differs mainly by its less-elevated spire and large umbilicus.

Habitat.—Taken alive in considerable numbers in March, 1876, beneath blocks of stones on the outcrop of the auriferous reef at Waukaringa, S. Australia.—*R. Tate.*

Between Victoria Spring and Fraser Range. One dead specimen.

Helix (Hadra) Everardensis, *spec. nov.*

(Pl. I., figs. 3*a*—3*c*.)

Shell umbilicated, globosely conical, somewhat thin, translucent ; lower whorls closely ribbed by stout irregular and oblique flat-topped costæ, which are coarsest behind the aperture, and gradually fade away on the upper whorls into fine striæ ; under the lens irregularly pitted throughout ; epidermis, pale yellow, much abraded, exposing in places the chalky-white of the shell substance ; encircled immediately above the periphery by a

chocolate zone about a millimetre broad, and beneath the suture, which is impressed, a slightly narrower band of the same hue, the intervening space being wider than either band, the spire is so coiled that the suture throughout its extent divides the lower band of the upper whorl from the upper band of the succeeding one, lip of aperture white; whorls four and a half, gradually increasing, evenly rounded from the suture to the base, last descending in an alignment with the peripheral band; aperture very oblique, oval-lunate, slightly expanded and reflected above, and much so beneath; columella remarkable for its wide and straight expansion, callus thin, transparent; umbilicus narrow, deep, and spiral, abrupt at the margin and steep within, partially overhung by the dilated columella, and slightly choked by an internal swelling of the termination of the last whorl.

Dimensions.—Major diameter, 13 mm.; minor, 11·5 mm.; alt., 9·25 mm.; height and length of aperture, 6·75 mm.; diam. of umbilicus, 2·5 mm.

This species, of which only a single specimen was obtained, is the smallest member of the subgenus *Hadra* yet known, and comes very close to one taken during the expedition to Lake Eyre in the years 1874-5, of which there are two examples in the South Australian Museum collection.

Mr. Brazier on seeing the shell noted its very close resemblance to *H. australis*, Menke, but the figure of that species as reproduced in Dr. Cox's monograph could not be taken as a guide to its identification.

Near Illbillee Soakage, Everard Range, at an elevation of 2,000 feet.

Helix (Hadra) Elderi, *spec. nov.*

(Pl. I., figs. 2*a*—2*c*, 4, 5.)

Shell umbilicated, depressedly globose, thin, translucent, coarsely obliquely striated, more so at the suture; yellowish-white, and having two rufous bands, one, the broader, just above the periphery, and the other at the suture, the suture being wound round the centre of the lower band of the preceding whorl, and the right margin of the peristome inserted at the lower edge of this band; spire elevated, obtuse at the apex. Whorls five, convex, regularly increasing, the last rounded and inflated at the base in the region of the lip, descending slightly in front; aperture oblique, roundly lunate, margins approximating, peristome thin, broadly reflected, and very effusely dilated; columellar margin narrowly expanded above, and reflected over and partially concealing the umbilicus.

Measurements.—Major diam., 17 mm.; minor diam., 14 mm.;

alt., 12 mm.; height and length of aperture, 10 mm.; diameter of umbilicus, 2 mm.

This species is allied in its general characters to many South Australian congeners, and is also ornamented with the rufous bands so peculiar to the most of them, but is specially remarkable for the very effuse dilatation of the outer lip, more particularly so where it reaches the base of the shell.

Birksgate Range; under fig-trees amongst granite boulders.

The following anatomical notes are furnished by Mr. C. Hedley, F.L.S., of the Australian Museum :—

Two shells, containing the snails of *Hadra Elderi*, Bednall, were examined. The animals were much attenuated, and had evidently been captured during the course of a long fast. The aperture was sealed by a tough leathery epiphragm, behind which was packed a mass of congealed mucus, the snails having retired more than half-a-whorl within the shell. Though the shells indicated mature individuals, the genital system was shrunk into the condition of a half-grown animal, the consequence probably of starvation. I was therefore unable to make any observations upon this portion of their anatomy.

The jaw (pl.. I, fig. 4) is rather wide, boomerang-shaped, crossed by seven stout ribs which denticulate the concave but not the convex margin, ends rounded.

Radula (pl. I., fig. 5) strap-shaped, measuring 6 x 2 mm; formula 28 : 12 : 1 : 12 : 28. Rachidian cusp single, ovate-lanceolate, apex projecting beyond the basal margin; base broadly expanded anteriorly. Immediate laterals larger than the rachidian, cusps stout ovate, the tips overlapping the base; alate angle of the base expanded. In the remoter laterals the cusps grow more slender, and the bases diminish. Transition teeth show a distal accessory cusp budding from the base of the main cusp; then a proximal cusp appears near the summit of the main cusp. In the marginals these accessory cusps increase relatively while the teeth diminish in size till the extreme marginals offer trifid blades.

Bulimus dux, *Pfr.*

(Proc. Zool. Soc., p. 24, 1861; *Cox*, Monograph Australian Land-shells, p. 74, pl. xiii., fig. 4.)

A dull whitish shell, nearly two inches in length, with the interior tinged with pale pink. No specimens taken alive.

Fraser Range *(Elder Expedition)*; also King George's Sound *(Masters)*.

Bulimus melo, *Quoy et Gaimard*

(Voy. d'Astrolabe, Zool., vol. II., p. 110, pl. ix., fig. 6-7; *Cox*, Monograph Australian Land-shells, p. 74, pl. xiii., fig. 6.)

A somewhat solid inflated shining shell, of which there are several varieties showing special markings. Specimens taken by the Expedition were dead, but their form is sufficient for purposes of identification.

Between Victoria Spring and Fraser Range; and Fraser Range (*Elder Expedition*). Also King George's Sound (*Quoy et Gaimard* and *Masters*), Fremantle (*Bacon*).

BULINUS NEWCOMBI, *Adams and Angas.*

(P. Z. S. p., 416, 1863; *Reeve*, Con. Icon., pl. 3, f. 21.)

This species has a much inflated and somewhat produced aperture. It is widely distributed throughout the colony of South Australia; the type specimens are recorded from Mt. Margaret, Central Australia. It occurs in many of the streams flowing from the Flinders Range—in Mannanarie Creek at Wirrabara; in the Rocky River at Laura; in the Nelshaby Reservoir; also on Eyre Peninsula *(Tate);* and in more southern localities it has been taken in the River Para *(Tate)*, the River Angas at Strathalbyn, and in the South-East at Penola, Binnum, and other adjacent localities by the late Mr. Tomsett.

Upper Arkaringa Creek *(Elder Expedition).*

EXPLANATION TO PLATE I.

Fig.

1*a*-1*c*. Helix fodinalis, *Tate*. Three views slightly enlarged.

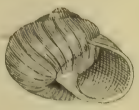
2*a*-2*c*. Helix Elderi, *Bednall*. Three views slightly enlarged.

3*a*-3*c*. Helix Everardensis, *Bednall*. Three views slightly enlarged.

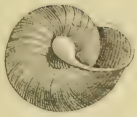
4. Jaw of Helix Elderi, magnified.

5. Six teeth from different regions of the radula of Helix Elderi; their relative positions are indicated by numerals annexed. Highly magnified.

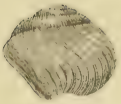
6. Helix perinflata, *Pfeiffer*. Nat. size.



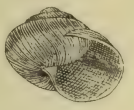
1a.



1b.

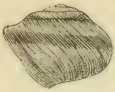


1c.



2a.

2b.



2c.

3a.

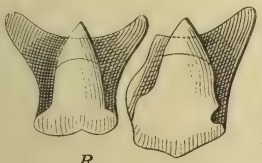
3b.

3c.

6

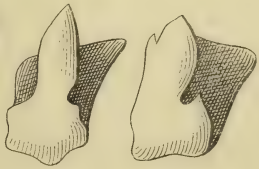
4

5



R

1.



12.

20.

24.

35.

H.B. lith.

Hussey & Gillingham. Lith.

HYMENOPTERA.

By WALTER W. FROGGATT,

Technological Museum, Sydney.

The Hymenoptera collected by Mr. R. Helms, of the Elder Exploring Expedition, having been handed to me to classify, I submit the following account of them. In several instances I have to pass over several interesting insects that are very likely new species, as I do not feel justified in describing them without a better knowledge of the literature of this much neglected group in Australia, than is accessible to me in Sydney; while as regards the ants I abstain from dealing with them, as my knowledge of the family is very superficial.

Considering that the collection is the result of nearly nine months gathering in the sandy ridges and ranges of Central Australia, I think it very meagre, and remarkable for containing none of the typical fossorial wasps of this part of the continent, while the Pompilidæ, Sphegidæ, Vespidæ, and larger Eumenidæ are very poorly represented, and the Formicidæ comprises only eight species from a country which simply swarms with ants in ordinary seasons.

However, in all expeditions, even under the best management, collectors have many difficulties to contend with, that often prevent them from making such extensive collections as they might wish.

This collection contains 57 specimens (including a number of small ants on a card as one). The following is a list of specimens in their natural order, with the locality as given on the collector's label:—

ICHNEUMONIDÆ.

Cryptus, *sp.*

This is one of our commonest species, and has a very wide range over the whole of Australia, about Sydney it is parasitic on the larvæ of several common moths that crawl upon the grass.

Mount Squires; one example.

Ophion (three species).

Only one species of this genus has been described from Australia, and most likely these, apparently three distinct species are

new, but it is a very difficult group to work at without plenty of material, and one of the specimens has lost its abdomen.

Cootanoorina Creek ; one specimen of each species.

EVANIIDÆ.

Gasteruption, *sp.*

This appears to be the same species that we find in the vicinity of Sydney.

Mount Squires ; two specimens.

FORMICIDÆ.

The ants consist of eight different species, none of which are very remarkable ; chief among them is a metallic-green ant, of which there are thirteen specimens from Victoria Desert ; a large hairy ground-ant, a small *Myrmica*, a *Formica*, a number of small ants gummed on a card, and several others.

MUTILLIDÆ.

Mutilla formicaria, *Fabr.*

This is one of our largest *Mutilla*, and has a very wide range over Australia. It was one of the many insects obtained by Banks, and described in Fabricius' "Systematica Entomologica." This specimen looks as though it had been in spirits, as the white pubescence and hairs are apparently discoloured ; it is somewhat larger than those obtained in the vicinity of Sydney.

Victoria Desert, W.A.; one female.

Mutilla Elderi, *sp. nov.*

Female. Length, 2 lines.

Black, legs ferruginous, ornamented with a patch of yellow hairs upon the abdomen.

Head very round, finely punctured, and covered with scattered black hairs ; thorax square in front, swelling outwards from the prothorax, narrow at metathorax, covered with large confluent punctures, and clothed with scattered white hairs at base; legs ferruginous, and very hairy.

Abdomen, first segment narrow, finely punctured, clothed with scattered white hairs at base ; second segment large, oval, finely but deeply punctured, clothed on sides with scattered black hairs, the centre covered with a dense patch of golden hairs, which occupy the whole length of segment ; third, fourth, and fifth segments fringed with yellow hairs ; sixth segment shiny ferruginous, smooth, and shining.

Fraser Range, West Australia.

THYNNIDÆ.

Thynnus taeniolatus, *sp. nov.*

Male. Length, 6 lines.

Head black, round, covered with white hairs on face, finely rugose on forehead; thorax and legs black, a pale white band along the outer margin of mesothorax, which is finely punctured, with an impressed line on either side, a white mark on either side of the mesothorax from the base of hindwing to the bottom of scutellum; scutellum broad at base, twice the width of apex, which is margined with a white mark. Wings slightly fuscous. Abdomen black, first segment marked with pale yellow fascia almost divided in two by small black line; second, third, fourth, and fifth segments marked with broad yellow fasciæ, which are roundish, and interrupted in centre with small black line, the outer edge of these segments margined with whitish yellow. Underside of first segment with small wedge-shaped spot, of third, fourth, and fifth marked with club-shaped patch, the apex of each margined the lower edges of the segment with dull white.

One specimen in damaged condition, having lost its antennae.

Rhagigaster integer, *Fabr.*

This is a common species, having a very wide distribution over the greater part of Southern Australia.

Victoria Desert.

LARRIDÆ.

Pison, *sp.*

Mount Squires.

POMPILIDÆ.

Ferreola, *sp.*

Fraser Range.

EUMENIDÆ.

Odynerus, *spp.*

Three species of this genus are represented, though it is quite possible that one is only a variety. Many of our Australian *Odynerus* are described in Saussure's "Supplement to his Monograph of the Vespidæ," a work that is not obtainable in any of our Australian libraries.

Mount Squires.

ANDRENIDÆ

Halticus, *sp.*

Mount Squires; one specimen, a small burrowing bee, probably a new species.

GENUS AND SP. UNCERT.

Victoria Desert ; one specimen, a very curious little banded bee with a broad abdomen.

GENUS AND SP. UNCERT.

Mount Squires ; seven specimens of burrowing bee.

APIDÆ.

ANTHOPORA CINGULATA, *Fab.*

Described under the name *Andrena cingulata* in his Systematica Entomologica, vol. II., p. 314.

This pretty little banded bee has a very wide range over the southern parts of Australia, and is not uncommon about Sydney.

Three specimens ; Nilpena, Central Australia.

SARAPODA BOMBILIFORMIS, *Smith.*

This fine bee is common about Sydney in the summer, often flying into the house.

One specimen ; Mount Squires.

CROCISA ALBO-MACULATA, *Smith.*

Also recorded from the northern parts of New South Wales and Queensland.

Mount Squires ; two specimens.

MEGACHILE BLACKBURNII, *sp. nov.*

Female. Length 8 lines, black, clothed with white hairs.

Tongue and mouth parts ferruginous ; head very closely and finely punctured ; face densely clothed with silvery white hairs, which form a thick brush, drooping down over the mandibles ; cheeks behind the eyes and underside of head closely covered with silvery white hairs ; thorax very finely but closely punctured covered with a close pile of white hairs on the underside and at apex above.

Fore legs ferruginous on the upper side of tibiæ, under portion dark-brown, tarsi produced into bright yellow pollen brush, claw ferruginous, covered with white hairs ; middle legs ferruginous on upper side of tibiæ and tarsi, dark-brown on underside, clothed with white hairs ; tarsi ferruginous, and fringed with white hairs much longer at base of tarsi.

Abdomen constricted at base of each segment with narrow smooth impressed band, which is more finely punctured than upper portion of segment ; first segment densely clothed in long white hairs ; second segment with scattered white hairs and a bright white patch of close short silvery hairs on either side ;

third segment similarly ornamented with smaller white patches, the following segments shining, lightly fringed on lower margins with white hairs ; underside of abdomen clothed with long white hairs forming a tuft standing out on either side of the last segment.

Wings hyaline, upper portion of marginal cell and outer edges of forewings faintly fuscous, nervures black.

Three specimens.

Male ; 5 lines. Black, finely punctured and covered with white hairs, differing from female in having all the legs black and closely covered with white hairs, the upper sides of first and second segments of abdomen clothed with long white hairs, and the remaining segments with scattered white hairs.

Mount Squires ; one specimen.

GEOLOGY.

By VICTOR STREICH.

Graduate of the Mining Academy, Freiberg; Geologist to the Expedition.

Geological Map and Plates II.—V.

CONTENTS.

I. The country between Warrina and Everard Range, geological summary.

II. Everard Range to Barrow Range.
- Physiography.
- Descriptive Geology.
  - Recent surface deposits and Tertiary Rocks.
  - Palæozoic and Metamorphic Rocks.
  - Eruptive Rocks.
- Mineral Prospects.
- Subterranean Water Supply.

III. Barrow Range across Victoria Desert to Fraser Range.
- Physiography.
- Descriptive Geology.
  - Recent formations.
  - Cretaceous Rocks.
  - Palæozoic Rocks.
- Mineral Prospects.
- Subterranean Water Supply.

IV. Fraser Range to Murchison Goldfield.
- Physiographical Features.
- Descriptive Geology.
  - Fundamental Rock-structure.
  - Cainozoic Rocks, Desert Sandstone.
  - Palæozoic or Archæan Rocks.
- Mineral Prospects and Water Supply.

V. List of rock- and mineral-specimens.

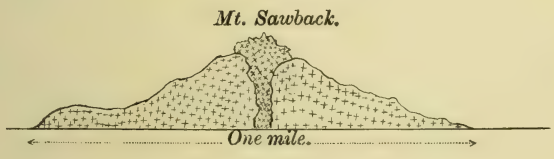
VI. Appendix.
- List of rock-specimens collected by Mr. Wells.

FIG 1.

Horizontal Scale : 16 miles, 1 inch.

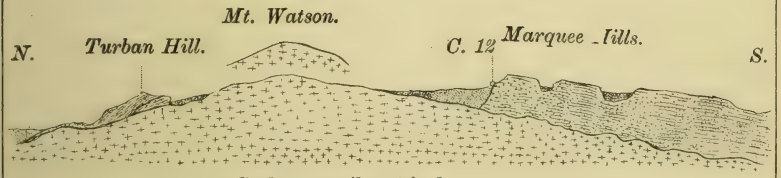
Recent deposits. *Travertine.* *Granite.*

FIG. 2.



Granite. *Diorite.*

FIG. 3.

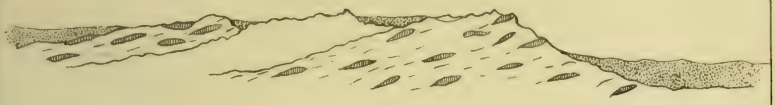


Scale : 16 miles, 1 inch.

Recent. *Sandstones and Grits.* *Granites.*

E.C.M

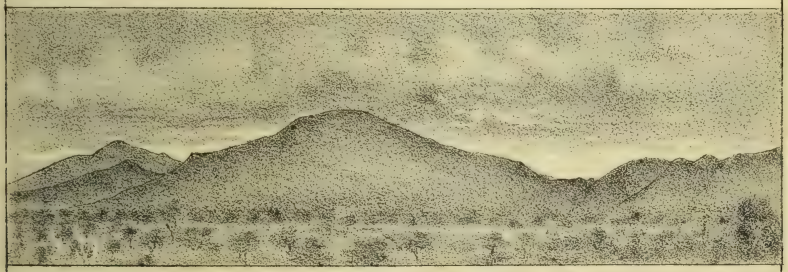
FIG. 4.



Sand. *Travertine with carbonaceous "eyes."* *Chalcedony.*

Scale: 24 ft., 1 inch.

FIG. 5.



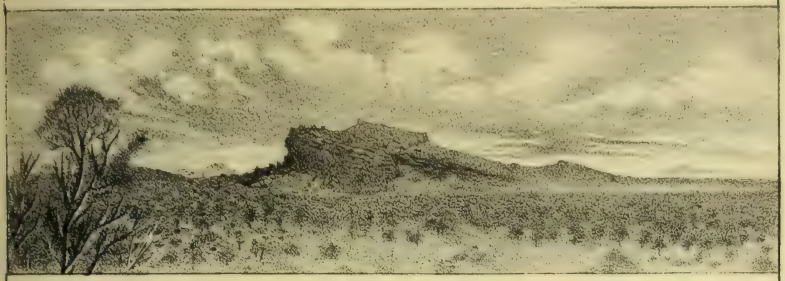
Mt. Watson (Granite Range).

FIG. 6.

Birksgate Range (Granite).

E.C.M

FIG. 7.



Turban Hill (Marquee shape), Granite Range in background.

FIG. 8.

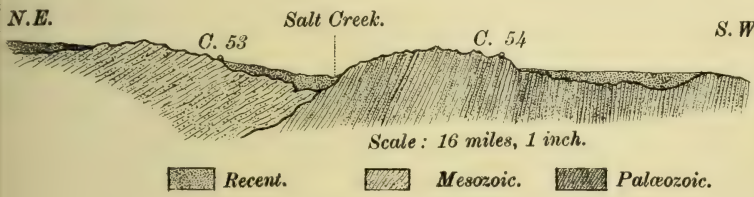


FIG. 9.

Æolian Erosion on sand.

FIG. 10.

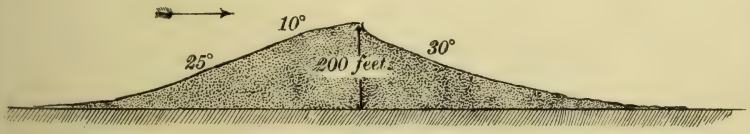


Diagram of Sand-dune.

E.C.M

FIG. 11.

Queen Victoria Spring.

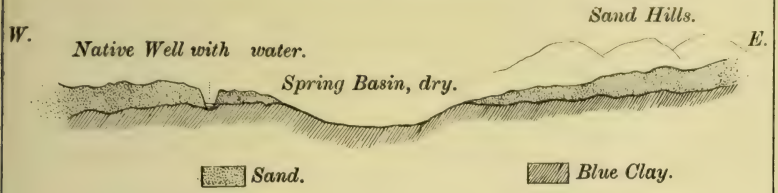
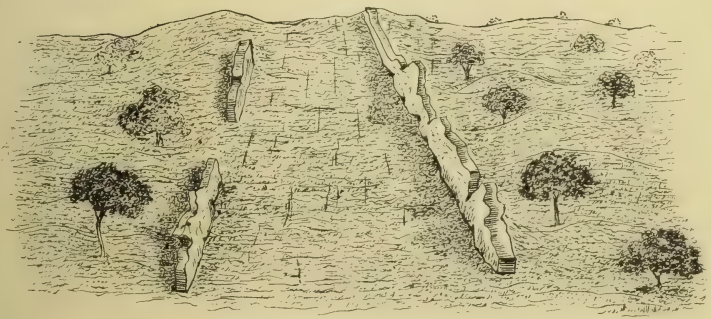


FIG. 12.

Scale: 24 miles, 1 inch.

Hornblendic schists. *Feldspathic schists.* *Siliceous schists.* *Recent.*

FIG. 13.



Granite Dykes at Fraser Range.

ECM

CHAPTER I.

The COUNTRY *between* WARRINA on the Great Northern Railway *and the* EVERARD RANGE having already been explored and geologically made known, I do not consider it necessary to give a detailed report upon it, though a brief summary of my interpretation of the geological phenomena may be expected from me.

From WARRINA to COOTANOORINA, about twenty miles distant, the surface-features are sandy ridges, trending north and south, alternating with clay and loam-flats of considerable area. The sands and loams overlie gypsum-bands and indurated gypsiferous clays, which, when rising above the level of the plain, appear as low flat-topped ridges. The wide flats bordering Arkaringa and Laura Creeks are copiously covered with efflorescent salts. All these deposits are of Newer Tertiary and Recent date.

Between Nilpena and Cootanoorina, where the formation changes from Tertiary to Cretaceous, mound-springs occur, which yield an unlimited supply of good stock-water.

Alongside ARKARINGA CREEK, near Cootanoorina, extensive gravel-beds exist, and the banks of the creek are composed of calcareous sandstone. These stony downs and gravelly plains continue as far as a line of elevated table-topped hills, which rise about 1,000 or 1,200 feet above sea-level, and on an average 500 feet above the plain ; they are distant about 60 miles from Warrina. The rocks of these table-topped hills comprise jasper-rock, flinty quartzites, sandstone and conglomerate in horizontal or slightly undulating beds ; the whole formation is of Cretaceous age. About 110 miles west from Warrina the Cretaceous formation is covered by red sands and loams of late Tertiary age, which continue as superficial deposits to near ARCOELLINA WELL, 157 miles from Warrina. Here Palæozoic rocks make their appearance, consisting of quartzites, argillaceous slates and sandstones ; they rise in Mount Chandler and Chambers Bluff to a considerable altitude, extend for a long distance in a S.W. direction, and are highly promising for mineral prospecting. Ten miles west from Arcoellina, these rocks are concealed beneath wide loamy plains, but re-appear to the south-east bordering the main mass of the Everard Range, as gneiss and other schists.

The EVERARD RANGE, which rises in Mount Illbillie to an elevation of 3,010 feet above sea-level, consists entirely of coarse granites apparently intruded among the fore-mentioned Palæozoics; the depressed areas, which interrupt the continuity of the range, are covered with loam and sand. The granitic rocks are intersected occasionally, but more so in the southern portion of the range, by dykes of diorite. Generally the granite contains little or no mica, and a little only of hornblende.

CHAPTER II.

From the Everard Range, S. Aust., to the Barrow Range, W. Aust.

I. PHYSIOGRAPHY.

The Everard Range extends westward as far as Ferdinand River, a distance of 50 miles reckoned from Mount Illbillie. Several strong creeks discharge themselves along the southern base of the range; and between its main mass and the outlying parts there are fine alluvial flats covered with a good soil consisting of a clayey mixture of the decomposed felspathic rocks which surround them. The creeks, winding through tectonic valleys of the granite-masses, have considerably enlarged some of them by their erosive action; especially is this the case in the lower parts of the valleys. No sooner do these creeks leave the granitic surfaces than they disappear suddenly in the sand, such places being rendered conspicuous by the abundance of grass and herbage arising from the underground storage of water.

The granite-rocks have, hereabouts, a tendency to weather into cavernous recesses, in one of which pictorial designs done by the aborigines were discovered.

As Ferdinand River is approached, the outcropping rocks become fewer and less prominent, and when of granite they tend more and more to the form of low turtle-back-shaped rises.

On both sides of Ferdinand Creek low ridges or banks of limestone are noticeable, which define the ancient bed or the limit of its former area of inundation (see fig. 1, pl. ii.). The width of the creek is about 20 yards, but was perfectly dry at the time we crossed it. Judging from the fine-grained sand and the absence of large gravel and debris, the descent of the river is not very steep, and the power of the periodical floods is limited as far as erosion or ablation is concerned. The river-banks are therefore low, not exceeding six feet, and are composed of fine sand, without gravel, throughout that depth.

After crossing the Ferdinand, sand-dunes of moderate elevation make their appearance; they exhibit no regularity as regards direction, probably because of the irregularity in the direction of the wind, which is here influenced and broken by the surrounding hills.

The general surface-feature between Everard Range and Camp 4 is that of large alluvial sandy plains, the sand resulting from the weathering of the granitic rocks which rise abruptly from the plain in bold masses and peaks. At their base and in their vicinity travertine is of constant occurrence.

The elevation of the plain above sea-level is at the Ferdinand about 1,800 feet, as determined by barometric observation; and

at Camp 4 1,575 feet, as determined by hypsometric observation.

From Camp 4 Messrs. Lindsay and Helms made a flying-trip towards the south for about 50 miles. From the nature of the specimens collected by Mr. Helms from actual outcrops, and from the ascertained topographical configuration, the country in this direction seems to change very suddenly in proportionately short distances. Starting from Camp 4, the same class of country extended to ten miles; next, low sandstone-ridges were traversed for 15 miles, after which claypans, with abundance of crystallised gypsum, were conspicuous features, and here traces of an extinct mound-spring were observed.

Leaving Camp 4 in a chiefly south-west direction, the country travelled over was of the same character until Camp 12 was reached, namely, granite intersected by greenstone-dykes, which appear as boulders and bosses rising out of sandy plains now and then, but especially in the vicinity of the granitic rocks low banks of travertine occur. In this part of the country the sand-dunes are more numerous, and the intervening depressions are covered with gravel or coarse sand; their general trend is north and south, and their height from 20 to 25 feet.

Towards the north the Musgrave Range is visible as a long line of bold peaks shadowed in a dim, blue light; to the south low, indistinct ranges are noticeable.

The mean height of the plains is here 1,560 feet, by barometric reading, and the granite hills do not exceed 250 feet.

Travelling from Camp 6 in a southerly direction we passed long, low hills having the shape of a marquee (see fig. 3, pl. 2, fig. 7, pl. 4), and trending east and west. They seemed to be the continuation of the ridges of which Chambers Bluff is the most prominent elevation. They consist of quartzites and sandstones, and have a steep escarpment on the north side of about 50 or 70 feet, whilst the southerly slope is less abrupt. From one of the most elevated of these hills, 210 feet above the northern plain, several parallel lines of similar hills were noticeable to the south and west, some of them presenting steep, scarped fronts, also on the north; others were seen afterwards, from the tops of Mounts Watson and Sir Thomas, extending to the westward, which connect them with the Townsend Ridge, which was reached later.

Leaving this range on a north-westerly course, we travelled over sandy plains with wind-drifted, sand-dunes, the intervals between them being thickly wooded with "mulga," and eventually reached the outlying portions of the Birksgate Range. Mount Watson (see fig. 5, pl. 3), the Birksgate Range (see fig. 6, pl. 3), and some smaller contiguous elevations consist of granite

in bold fantastic outlines ; they rise very abruptly out of the sandy plain, and are very little, or not at all, covered with vegetation. At the south-western base of the range, and in the wide plain-like valleys which are protected from drifting sand, there are winding creeks and flood-channels ; here herbage and timber is abundant, and a fair supply of surface-water is obtainable. The water-supply could, however, be considerably increased by damming the narrow gullies, and by sinking to the subterranean basins which intervene between the hills. The continuously-elevated ground occupies a large area, and outlying portions of the range occur at considerable distances away from it.

The western, more than the eastern section of the range, is penetrated by hornblendic rocks ; this feature is well-displayed in Mount Agnes and Blyth Hill (see fig. 2, pl. 2), the latter of which has a back-bone of diorite running right through it. The Blyth Range of Gosse, ill-defined by him, is now proved to be an outlying part of the Birksgate Range, and is degraded by Mr. D. Lindsay to the rank of Blyth Hill.

Mount Watson is a dome-like mass of imposing aspect (see fig. 5, pl. 3), 2,200 feet high, and 726 feet above the surrounding plain ; Mount Sir Thomas, the highest elevation of the Birksgate Range, is 2,535 feet above sea-level, and 680 feet above the plain ; Blyth Hill is 2,300 feet above sea-level, and 550 feet above the level of the plain, as determined by Mr. Lindsay. The mean elevation of the plain, deducible from the above figures, is 1,700 feet above the level of the sea.

The soil in the wide valleys of the Birksgate Range is of a rich loamy nature, and principally overlies travertine ; beyond them drift sand, clothed with a luxuriant growth of porcupine-grass, is prevalent.

Geologically and physiographically the stretch of country which ends in Mount Agnes is a moderately elevated granitic upheaval, roughly parallel with the Musgrave and Macdonnell Ranges. It is largely covered with alluvial deposits, which allow only the summits of the axis of elevation to be visible. Two of these masses are especially prominent ; the western one is composed of the Birksgate Range and its spurs, the eastern one of the Everard Range and its numerous outliers ; the latter is probably connected with the Musgrave Range to the north.

From Camp 24 the elevation of the spinifex-plain declines westward to the base of Skirmish Hill, where on Moses Creek the depression reaches its minimum of 1,335 feet above sea-level, as determined by the hypsometer, representing a fall of about 400 feet in from 40 to 50 miles.

Skirmish Hill is a somewhat isolated eminence, 580 feet above the plain at its eastern base. Though it is apparently connected

with the adjacent Tomkinson Range to the north, it consists of a porphyritic rock. Moses Creek, which debouches on the eastern plain, has a very short course. It is here we found a tree which had successively been blazed by the explorers Gosse, J. Forrest, and Mills.

At about 50 miles from Skirmish Hill the Cavenagh Range was reached. The intervening country was of the most desolate appearance. Travertine and sand-dunes abound, interrupted only by one low granitic ridge, much intersected by quartz-dykes. In this granitic ridge occurs a rock-hole of most peculiar shape, which yielded us several hundred gallons of water. It is in the form of a narrow channel about two feet wide and about seven or eight feet long, sloping to the west, then extending easterly into a horizontal chamber some six feet wide. Close to this rock-hole I found under some sheltering rocks an abundance of flint- and chalcedony-chips, apparently the refuse from the manufacture of stone-implements. Intermingling with these were marsupial-bones, so that the whole constitutes a veritable "kitchen-midden." Similar accumulations I had noticed at Camp 20, which was also near a big waterhole, and at Camp 23, in the Barrow Range.

The Cavenagh Range, which rises in Mount Cooper to 2,175 feet above sea-level, is composed of plutonic and trappean rocks; the interspersed wide valleys are well-grassed, and each is generally traversed by a creek. E. Giles records,* during his four or five days' halt in this neighbourhood in the month of December, the daily passage of an earthquake-wave at about 3 p.m., accompanied by "the sounds of smashing and falling of rocks hurled from their native eminences, rumbling and crushing into the glen below," coincident with which on one occasion was a temporary interruption to the flow of water from a spring.

The very compact diorites of the higher part of the range are weathered into immense boulder-like masses and bosses, the former of which are sometimes poised on top of one another in a very extraordinary manner. It is therefore highly probable that some of these poised-blocks, expanding under the influence of the fierce sun of a Central Australian summer, do lose their equilibrium, and, tumbling down, cause a regular mountain-slip, which may for some time block the flow of a weak-running rivulet. The coincidence in time of the daily occurrence of the so-called earthquake-shock with that of the most intense heat lends support to my explanation of the cause of the phenomenon and its periodic recurrence. Moreover, with the view to the fullest investigation possible to me, I erected a kind of seismograph, after the plan of

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* Geographic Travels in Central Australia, p. 132.

Mallet, but not the least indication of a terrestrial wave was experienced.

Between the Cavenagh and Barrow Ranges, a distance of 25 miles, the surface features are low sand-ridges, alternating with travertine deposits. The Barrow Range is constituted of a parallel series of granite hills, having a north and south trend, at least in its southern section, which alone was visited by us. At its southern end the range attains its highest elevation in Mount Squires, of 2,270 feet above sea-level. It consists chiefly of semiporhyritic rocks, and the much-broken country gives rise to several creeks, which water alluvial flats carrying a rich growth of herbage and other vegetation. South from Mount Squires are low ridges of sandstone, which are connected towards the west with Townsend Ridge.

The principal axes of elevation in Central Australia are the Macdonnell, Musgrave, and Everard Ranges, which represent a series of almost parallel waves or undulations of contemporaneous origin. The most southerly is the Everard Range, which continued through Mount Agnes and Blyth Hill, is obliquely connected with the Tomkinson Range; the westerly extension of the Musgrave Range. This gigantic upheaval, viewed as one, is bounded on the south by a belt of sedimentary rocks, probably of Devonian age, which commences with the ranges about Mount Chandler and Chambers Bluff on the east, and ends in Townsend Ridge on the west. The country examined by me, which lies between these two boundaries, viz., to the north the Archæans of the Central Australian elevation, and to the south the less prominent upheavals of a more recent date, is occupied by the debris of the formerly overlying sedimentary formations. Thus the general geology of this section of the journey is of a simple kind; but the stratigraphical phemonena in detail are not without interest, as may be gathered from the following description.

II.—DESCRIPTIVE GEOLOGY.

A. Sedimentary Rocks.

1. Recent Surface Deposits and Tertiary Rocks.

From the Everard Range the country slopes gradually to the west as far as Ferdinand River, on either side of which, but at some distance off, outcrops of *travertine*, with alternating ridges of *chalcedony* appear (see fig. 4, pl. 3). These strata as superficial deposits are next in importance to the loams and sands, which occupy a very large area of country between Everard and Barrow Ranges. In some localities the limestone is interstratified with layers of chalcedony and lenticular masses of a travertine blackened by carbonaceous matter; both I regard as a secondary

product resulting from the decomposition of the neighbouring granitic and hornblendic rocks.

The *travertine* has frequently a concretionary structure, and includes sand and fragments of the adjacent rocks ; sometimes it cements the gravel of the plains to a form of conglomerate. The thickness of the travertine crust varies considerably up to twelve feet.

The lenticular masses of *black travertine* attain to three or four feet in the longer diameter ; if broken, or the pieces be rubbed together, an empyreumatic odour is given off. An analysis of a sample from Ferdinand River gave the following percentage values :—Carbon, 8 ; calcic carbonate, 38 ; magnesic carbonate, 11 ; silica and oxide of iron, &c., 43. (Similar blackened concretionary travertine is described by Professor Tate from the country around the Great Bight in Trans. Roy. Soc. S. Aust., vol. 3, p. 115).

Chalcedony as a stratified deposit was found *in situ* at several places, especially along the western bank of Ferdinand River, where it forms a stratum of three feet thick beneath travertine. As debris, chalcedony is found in great abundance all over the area under consideration ; not only profusely scattered over the plains, and forming an integral part of the sands, but abundantly diffused over the granitic rocks of this region. It was found as high as 2,700 feet on Mount Sir Thomas, and also on the top of Mount Illbillie, 3,100 feet.

These siliceous accumulations, as well as the above-mentioned calcareous ones, must be regarded as aggregations of siliceous or calcareous material, as the case may be, derived from the Tertiary or the fundamental Azoic rocks. Their formation may still be going on, especially in and near creek-beds ; and no doubt whether it be continuous or not, it is contemporaneous with the latest and most abundant superficial deposit—that of the sand.

The *sand-ridges* reach a height of, not exceeding, 60 feet. They have a general trend of north and south, though their course is occasionally interrupted by granitic outcrops. The material is a fine drift-sand, chiefly composed of quartz, either white or ferruginous ; particles of felspar are seldom discernible. The thickness of the sand-cover is very variable ; anything like a *subsoil* could not be seen, unless the wide loamy flats which occur between, and particularly on the south-east side of the ranges, are to be regarded as representing it.

The *loamy flats* are generally watered by creeks, and where this is the case *fluviatile gravels* are of frequent occurrence. No gravel-plains, as the term is understood in the northern part of South Australia, exist in this region ; but its gravel-beds are of true fluviatile origin—the outcome of the erosive force of the

flooded creeks, and they seldom extend beyond a few hundred yards from the mountain-slope from which they have been derived. River-formed gravels of some extent occur in Moses Creek at Skirmish Hill, and near Fort Mueller in the Cavenagh Range.

Clay-pans are very scarce in this country. A few of very limited area were observed inside Cavenagh Range, and near Barrow Range.

2. Palæozoic and Metamorphic Rocks.

This formation constitutes the marquee-shaped hills*; already described as running almost parallel with the granitic ranges. At Camp 11, where these rocks were first encountered, they are about 40 miles distant from the nearest granitic upheaval, a distance which was also approximately ascertained by Messrs. Lindsay and Helms and by Mr. Wells on their respective flying-trips towards the south. There can be no doubt that these hills are geologically identical with those to south and south-east of the Everard Range, and with the Townsend Ridges further westward; and it may be safely inferred that the same formation composes the Warburton and Sutherland Ranges, although the rock-specimens from the former, collected by Mr. Lindsay, are not exactly the same as, whilst those from the latter, collected by Mr. Leech during a flying-trip to Gibson Desert, are similar to those from the Townsend Ridges.

The hills to the east and south east of the Everard Range consist chiefly of quartzites and sandstones, with which are associated slate, limestone and gneiss. Specimens of all these were brought back by Mr. Helms from his flying-trip to the south. The marquee-hills consist chiefly of apparently unfossiliferous quartzites, but in a creek-bed, which occupies one of the valleys among them, there occurs a gravel consisting of mica-schist and gneiss, and though I did not succeed in finding these schistose rocks *in situ*, yet there can be no doubt that they are component parts of the Palæozoic formations in this region. Moreover in Turban Hill the relation of the quartzite to the metamorphic rocks is well-defined. The basal part of the section consists of a metamorphic granite, and the upper part of a quartzite, whilst the intermediate beds show a passage from one to the other; the succession from below upwards is as follows:—Granite containing quartz-pebbles, a silico-feldspathic magma, changing into quartzite, ferruginous quartzite, whitish-coloured quartzite.

Two small outcrops of primary rocks occur, at ten miles east

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* Probably identical with the Tent-Hill formation of Mr. H. Y. L. Brown, Government Geologist of S. Aust. See Report on the Geology between Port Augusta and Eucla, 1885, p. 2.

of Barrow Range, as isolated hills of granulite, which is distinctly stratified with a low angle of dip towards south. I consider this granulite as a part of the formation of the Townsend Ridges, of which it may represent a lower stratum. Pieces of a scaly quartzite, containing small laminæ of white mica were picked up at old "wurleys" and camping places of the blacks, who have apparently used them as grinding-stones for seeds, and, although not seen *in situ*, yet there is presumptive evidence that this very distinctive rock occurs within the geographic limits of the tribe. A specimen of a similar quartzite was collected by Mr. Leech at the Sutherland Range, where it, as he informed me, occurs in low ridges, with a southerly escarpment.

The width of this Palæozoic belt, of which quartzite seems to be the main component, varies probably very much, but from the evidence already adduced, it extends between latitudes 27° 35′ and 28° 30′, at least 100 miles towards south, whilst at the Townsend Ridges it does not exceed 30 miles, though it is here abundantly covered with Tertiary deposits.

B. Eruptive Rocks.

1. Plutonic Rocks.—*Granite* of a truly eruptive character is the most prevalent member of this class. At all places of its occurrence it presents on the surface a spheroid or ellipsoid outline, and exhibits internally a concentric structure. Large cuboidal masses of it are abundantly scattered over the granite hills, their shape being the result of cleavage in three directions almost perpendicular to each other. The Everard and Birksgate Ranges consist almost entirely of eruptive granite, as also the main mass of Barrow Range. However, outcrops of granite were observed which possessed a somewhat metamorphic character; but these were generally as outliers of the main ranges, and very probably belong to the schistose series overlying the eruptive granite.

The eruptive granite is generally poor or destitute of mica, its substitute being either hornblende or epidote; felspar crystals are prevalent, they are generally colourless or milky white, but are of a yellowish red when found on the surface.

Diorite.—As already mentioned, p. 77, the granite is very frequently intersected by dioritic dykes; they prevail in the country between Mount Gosse and Barrow Range, and in Cavenagh Range the hornblendic eruptive rocks reach their maximum of development, as these hills are entirely composed of them. In the Cavenagh Range there occurs a diorite which has a stratified structure, not only petrographic but also architectonic, but in spite of this I do not hesitate to pronounce it eruptive, as I attribute the parallel position of the pyroxene crystals to a kind of macro-fluctuation structure. The dioritic

intrusions do not appear to have metamorphosed the granitic rocks in the slightest degree, except at one place, where a binary granite was found enclosed between two dykes of diorite, whereas the granite exterior to the dykes is of the usual composition.

Less frequent of occurrence and not largely developed, there were found the following varieties of eruptive rocks :–

Diabase, intersecting granite and diorite.

Eurite, as ill-defined intrusions in granite.

Syenite is fairly developed in Skirmish Hill and Mount Squires ; it forms a transition between porphyritic syenite and typical syenite. The outline of the hills of syenite is less bizarre than that of the granite hills. The glens and valleys among them have every appearance of tectonic, and not erosive origin. The syenite, as also the granite, carries sometimes veins of epidote and epidote-rock (epidosite).

Porphyrites in several varieties occur at Skirmish Hill.

2. Volcanic Rocks.—A dark aphanitic rock, forming the top of Mount Squires, may be referred to under this head ; it seems to have penetrated the diorite. It resembles closely Tachylite, though I hesitate to name as such, not having examined it microscopically.

3. Tuffaceous Rocks —Surrounding Skirmish Hill, porphyritic tuffas were found alternately with porphyritic breccias and claystones ; they resemble closely a claystone (porphyrtuff) occurring at Rochlitz, in Saxony, which carries also small veins of lithomarge as a secondary product of decomposition, as does also the claystone in question.

4. Extra-limital Volcanic Rocks.—Two specimens of the well-known obsidian bombs, and of the usual shape were collected, one at Birksgate Range and one near Mount Squires. No clue could, however, be obtained as to the original site, or in explanation of their wide-spead occurrence.

III.—MINERAL-PROSPECTS.

As the Everard, Tomkinson, Cavenagh, and Barrow Ranges consist almost entirely of eruptive, generally granitic, rocks, it may be readily understood that they do not warrant any prospects for minerals. Moreover, the scarcity of water (which is insufficient in quantity for gold-washing on a large scale) and the almost certain absence of any kind of surface-indications of veins or lode-formations in these mountains are most unfavourable circumstances. Furthermore, the extensive cover of sand and loam which allows only the uppermost and steepest parts of the ranges being seen, is in itself a great drawback to prospecting.

The marquee-shaped hills forming the Palæozoic belt, which

bounds the Azoic rocks of the main upheavals on the south, may give more encouraging prospects. Considering, however, that they are of the same age as the hills and ranges to the east of Everard Range, it would be superfluous to search them for the precious metals until the former, which are more favourably situated, have been proved to be metalliferous.

IV.—SUBTERRANEAN WATER-SUPPLY.

During our sojourn in this country water was obtainable only from open rock-holes. Only on one occasion was there secured a small supply by shallow sinking in a creek-bed near Mount Watson. It must be remembered, however, that all the creeks have very short courses, and, debouching on the plains, are lost at once in the sand; but here the precious fluid may be obtained by sinking wells. As the ranges are seldom continuous, though of course connected underneath, large subterranean basins serving as receptacles for the surface-water must occur in the depressed intervals. The denser vegetation and better herbage in the wide valleys lend support to my conjecture.

A more feasible method of obtaining a permanent supply of water is, I think, by the construction of dams. The short and not-too-strong running creeks would allow of strong dams being built on a rocky foundation.

Splendid sites for conserving water by means of excavated tanks are not infrequent; but I do not think water in any quantity will be obtained by sinking in the bed-rock.

CHAPTER III.

From Barrow Range across the Great Victoria Desert to the Fraser Range.

I. PHYSIOGRAPHY.

This area on this line of traverse may be best described as the most westerly part of the Great Australian Mesozoic basin. Neglecting the cover of Tertiary deposits, although so abundant, and a limited outcrop of metamorphic schist about half-way across the desert, the Mesozoic rocks extend from the Townsend Ridges to the ranges west of Victoria Spring.

The country explored represents, as regards contour and general appearance, a very uniform dismal aspect, sand-plains and sand-hills are the chief features of this division.

The outcrops of Mesozoic rocks are very scanty, but wherever found they seemed to belong to a system of terraces, having a general N.W. and S.E. trend, their strata dipping at a low angle

to the north-east. The southern escarpment is less frequently concealed than the northern one. Though no actual contacts were observed, yet it is highly probable that Palæozoic rocks underlie this Cretaceous basin.

After leaving Mount Squires, a series of quartzite hills was passed, being the continuation of the Townsend Ridges, which could be dimly seen towards west. They have steep, almost perpendicular slopes, and approximate mostly in shape to the Marquee Hills. This formation is distinctly different to the one to be mentioned later, which also consists of quartzites and sandstones, but the form of these ridges and ranges is more of the Table Hill shape.

After crossing the Townsend Ridge, the country shows for the next 36 miles nothing but irregular sand-hills, alternating with widespread outcroppings of travertine and chalcedony rock.

The height of this stretch is between 1,000 and 1,200 feet above sea-level. A clay-pan (Camp 38) signifies, probably, the outer edge of the recent formation overlying the Devonian of the Tent Hill formation of the Townsend Ridges, and also the beginning of the Mesozoic basin, because for the next 150 miles the country, though different in its surface appearance on account of the more or less abundant cover of drift-sand or gravel plains, shows the same character, viz., quartzite terraces gradually descending towards south.

Between Camps 47 and 48, being about 150 miles from Camp 38, Tertiary formation was again met, consisting of nodular limestone with carbonaceous limestone-enclosures, also chalcedony, and a deposit of calcareous clay, apparently the result of mound-springs.

On proceeding further, another sandstone terrace was descended, and we entered wide plains with stunted growth on hard sandy soil or nodular limestone, but no outcrops of bed-rock were met with until between camps 53 and 54, a large dry salt creek was passed, on the south shore of which Palæozoic outcrops rise in cliffs of moderate height. (See fig. 8, pl. 4).

As this was in lat. 29°, and the formation distinctly trending towards E.S.E., it might be looked upon as portion of the Ooldea Range. Assuming this to be so, it would be a third parallel wave to the former mentioned Central Australian Archæan upheavals, extending as far as long. 124°, and rising out of the secondary rocks of this region.

From Camp 54 to Camp 60 (Queen Victoria Spring), for a distance of about 120 miles, the most wretched sand-hill country was traversed. There was no outcrop of anything like a bed-rock found, but only small travertine deposits.

In the valleys between the sand ridges gravel beds were sometimes found, but generally only of a coarse sand, more ferruginous than that composing the sand-hills. These sand-hills, especially N. and N.E. of Queen Victoria Spring, attain sometimes a height of 300 to 350 feet ; their trend being not only here, but all over the country passed through N.W. S.E.

Queen Victoria Spring is situated on the south-western boundary of the drift-sand area of Central Australia. These wind-drifted sand-hills reach their maximum in the sand-hills north and east of this spring of royal name, perhaps for the reason that as far as there the coastal winds of the Australian Bight are in action, counteracting the prevailing north-east winds of the interior, and thus forcing them to drop their burden of sand, causing in this way these immense accumulations spoken of before.

The height of Queen Victoria Spring is 830 feet above sea-level, though it is not the lowest depression thereabouts. Some 10 miles from Camp 58, a small claypan was crossed, the height of which was, according to the barometer, 700 feet above sea-level. The spring is situated at the base of these high sand-hills, in the middle of a small loamy flat, and occupies a basin some 20 yards in diameter (see fig. 11, pl. 5). Its bottom consists of a dark-blue clay. It does not deserve the name of a spring, but is simply a strong soakage supplied by the drainage of the high neighbouring sand-hills.

Having left Queen Victoria Spring, the country changed remarkably. Within the next 25 miles we ascended a ridge, striking N.S., consisting of quartzite, slowly rising to a height of 1,200 feet above sea-level, abundantly covered with a fine brown calcareous loam or loess and extensive patches of nodular travertine limestone.

In a deep valley which was traversed afterwards (between C. 62 and 63) granite and metamorphic rocks were found exposed, and also slates and schists cut through by a multitude of quartz veins.

After passing a salt lake between C. 61 and 62 the country rises again, and quartzite- and granite-outcroppings are observable. Apparently another range was traversed, the barometer showing 1,450 feet, and soon after that the hornblendic schists of the Fraser Range were reached. This range is closely connected towards N. and N.E. with the heights mentioned above ; but as seen from the east it rises abruptly out of the plains. Its highest elevation, called the Peak, is 2,010 feet high, and 765 above the station hut. It is a splendid stock country, with abundance of well water.

II.—DESCRIPTIVE GEOLOGY.

Encircled towards south by the Tertiary deposits of the Nullabor Plains, and to the north bordered by the Azoic formation of the Central Australian upheavals, an area of Mesozoic formation extends apparently as far as long. 123°, at least in this region. It is extensively covered with drift sand and other recent deposits, and no high elevations exist there, only the southern precipices of the flat-topped hills being denuded from surface covers.

As far as it could be observed the dip of the Mesozoic strata, chiefly quartzite, was generally not exceeding 15 degs., and was found invariably towards N.N.E.

The height of this area varies between 1,300 and 700 feet. In the metamorphic ranges of the south, however, which seem to form a barrier towards the coast plains, the height rises to 1,450 feet, according to aneroid measurements, and falls after passing the Fraser Range, according to Mr. Lindsay's observation, gradually towards the coast.

Recent Formations.

The sand which covers so largely the area previously referred to is the result of the disintegration of the gritty quartzites and sandstones of the desert. It is generally loose and wind-drifted in places, though it is somewhat consolidated by means of a clay-cement, but only on the surface, because if the uppermost crust of a thickness of one or two inches is removed, the loose sand is again met underneath.

It was here where an interesting occurrence of æolian erosion could be observed. When this uppermost crust had been broken through, the wind had carried away the loose sand, leaving now and then mushroom-like forms of sand, consisting of a small layer of consolidated sand on the top, supported by a column-like neck of less-impregnated, and therefore less-compact, sand. Sometimes also the cover consisted of a flat pebble (see fig. 9, pl. iv.). The north-easterly part of these æolian formations was more excavated than the other parts, due to the prevailing winds of the interior.

The colour of the sand is generally reddish-brown, and consists, I should say, up to 95 per cent. of quartz, the balance probably being lime, as the moderate occurrence of small calcareous concretions in the sand may prove that there is some (lime), though not visibly present.

These concretions have a cylindrical form, a concentric radiated structure, and are composed of sand cemented together by calcareous matter. They represent probably infiltrations and

fillings of the tubes of decayed roots of trees, burrows of insects and other small animals.

Another specimen of æolian action, the only one in force in this country is this :—It was observed that sand-hills generally consisted of a white quartz sand of a very uniform grain; whilst the one in the valleys between the sand-dunes was found to be sand mixed with gravel, this sand having invariably a reddish colour, and giving a striking contrast to the red sand-hills. I should like to explain this fact by supposing the wind acts as a natural air separator, as the white, and therefore pure, quartz of a lower specific gravity has been removed easier by the wind than the ferruginous red quartz, which is of course of higher specific gravity.

The shape of the sand-hills is invariably the same as given in fig. 10, pl. iv. The north-eastern slope is convex, gradually rising; whilst the south-western one avers to the prevalent course of wind, and has a steep précipice of four or five feet in height, leading to a concave, gradually flattening, incline.

These sand-dunes are really all parallel to each other, and very seldom found confluent.

The repeated proofs of their instability was observable on account of gum-trees growing on top of the sand ridges. The roots of these trees were often sticking far out on the lee side of the dune, entirely exposed and uncovered, whilst the roots on the opposite side were buried deeply in the accumulated sand.

Where the sand-dunes are not grown over with vegetation, splendid ripple marks may be noticed, covering especially the highest part of the dunes, and representing in miniature a system of æolian formations, as the sand-dunes do *en gros*.

When destitute of vegetation, these sand-dunes can be seen extending sometimes in one long line almost as far as the eye can reach. Their height is on an average 60 to 70 feet, except in the southern portion of the great Victorian Desert, where, when approaching the Queen Victoria Spring, sand-hills of 300 feet were traversed. They were there, however, less regular, and more tumbled and confluent.

This, I have reason to believe, is probably due to disturbances of the ærial influence, for, as explained in the meteorological notes, a climatic boundary exists there, where the dry continental N.E. winds and the coastal winds meet, causing thus a higher rainfall, which was also able to create a strong soakage on a favourable spot such as Queen Victoria Spring has been at one time.

This meeting of two winds from opposite directions also affected the accumulation of such immense sand deposits as found there, by causing the continental winds, heavily laden with

sand, to drop its burden, only allowing the finest suspended particles to be carried further, which gave rise to extended *loess* deposits bordering the sand deposits to the south-west.

It will be remembered that sandstone ridges were described as occurring in this portion of our journey, covered with accumulations of a fine-grained loam. The only possibility of explaining its occurrence in this country is by assuming its origin as subærial.

As it was ascertained that the sea-winds are active as far inland as this, and that also a barrier of high ridges is to be found there, these facts in themselves make the accumulation of loess easily explicable.

How deep these subærial deposits are could not be ascertained. According to their levelling tendency it was found more copiously deposited in the valleys of the bed-rock, where it was sometimes found excavated apparently by running waters to a depth of four to five feet, showing on the perpendicular faces thus produced the genuine land-loess structure.

The occurrence of such distinct courses of superficial water also points strongly to an uncommonly plentiful rainfall, produced, as explained above, by meeting of land and sea-wind.

Minor features of the surface formation of this section are :—

Claypans.—They were of moderate extent, and few in number. It will be remembered that when leaving the Devonian formation of the Sutherland Ridges, and entering the formation which has been taken as Mesozoic, claypans were mentioned as occurring thereabout. They also were met before and after crossing the metamorphic rocks described as occurring between Camp 53 and Camp 55, and again when leaving the Mesozoic formation, and entering the Palæozoic formation after having passed the Queen Victoria Spring. There they were partly covered with efflorescent salts, leading to so-called salt-lakes.

Should not the constant occurrence of claypans on or near the boundary of the sedimentary and the metamorphic formation point to an ascent of subterranean waters, which finds its way to the surface along the joints of the bed-rocks.

Even if it should not terminate in an actual egress of a spring, a perpetual wetness of stratified rocks must lead to a minute disintegration of its particles of physical action, as, for instance, freezing of its interstitial waters, as well as chemical action by depositing the saline matter by volatilizing, and forming thus a deposit of clay, gypsum, and salt, a combination of minerals of which all the claypans and salt-lakes consist.

The occurrence of an extinct mound-spring within the neighbourhood of claypans also points to an efflux of subterranean waters, which was one time even strong enough to penetrate to the surface in a continuous flow.

I have no doubt that the claypans and salt-lakes in the country described in this section originated in this way, but I have not the slightest intention of pronouncing all the salt-lakes as being of terrestrial origin.

By far the greatest number of them, and especially those met on the granitic high plateaux in Western Australia, are undoubtedly of oceanic origin.

Travertine Limestone.—The crust limestone was found in this region as well as in parts of the country already traversed. It was found invariably as a kind of a substratum of the sand deposits, and was always, if outcropping, an indication of the vicinity of sedimentary rocks. In the more arid parts of the great desert, that is to say, north of Queen Victoria Spring, the travertine was found compact, showing however, on breaking it a globular structure. In the country south of this spring the limestone nodules are found lying about loose, sometimes in big heaps, They vary in size from a pea to a hen's egg, are frequently perfectly spherical, and contain very often a nucleus of the underlying bed rocks. These nodules are the result of the disintegration of the compact travertine mentioned above.

Gravel Plains.—Gravel plains are hereabout of moderate extent only. The gravel consists of the derivative material of the chief component of the Mesozoic formation, namely, ferruginous sandstone. The abundance of drift-sand would not permit of anything like a widespread plain.

II.—MESOZOIC.

The formation which has been pronounced as Mesozoic consists in the following descending order, as observed on the outcropping terraces, of—

(1) Clay (indurated).
(2) Jasper rock.
(3) Conglomerate.
(4) Quartzite (desert quartzite).
(5) Sandstone.

The *Sandstones* and *Quartzites* are the main feature of the formation. They have been already referred to as escarpment-forming wherever they have been found. Lithologically they are in great variety, though they are generally close-grained and contain occasionally minute laminæ of mica. They are very tough before decomposition sets in, on account of the felspathic cement they contain, but when found somewhat advanced in decomposition the cement is more argillaceous.

Jasper and *Porcellanised Sandstones* are the next prominent feature in this formation. The gravel and gravel-conglomerate

found in the plains between the sand-ridges consist chiefly of this material, having in this state a thick coating of ferruginous matter.

Conglomerates were found on several of the aforesaid terraces. The component pebbles consist of quartz rock and lydite, and seemed to be consolidated only in a slight degree, as they were seldom encountered cemented together, but lying loose, and covering the base of the rises.

The indurated clay was found covering argillaceous sandstone in one place. The thickness of the stratum, however, seemed to be limited as far as the covering sands would permit of examination.

A mudstone occasionally cementing together the rubble of the underlying rocks, and found surrounding the water holes near Camp 40 and Camp 44 is of a secondary fresh-water formation, and of no intrinsic value.

Well aware of the insufficiency of ranging a series of sedimentary rocks under a certain geological formation only on account of the lithological character, as it was done in this case, it must be acknowledged that the lithological and stratigraphical features of the Mesozoic (Cretaceous) formation are in agreement with those of the typical area in Australia. Moreover they resemble the Cretaceous deposits met with in the early part of our journey, which have been proved to be of that age by means of fossils.

III—PALÆOZOIC.

Their first occurrence was between Camp 53 and Camp 55, and the second occasion towards the end of this part of the journey, when approaching the Fraser Range.

The Palæozoic rocks at the first-named spot formed a moderate high line of hills of a distinct north-east and south-west trend, the dip being 70° to 80° south (see fig. 8, pl. 4). Where this formation was traversed it was about 25 miles wide, the greatest breadth, however, seemed to be east and west with the trend of the hills. They consisted of garnetiferous gneiss, mica schist, pegmatite, and a breccia of the rubble of these rocks cemented by a siliceous material. The last is of course of secondary formation only.

There is not much to say about the lithological character of these rocks, but as regards their occurrence in this latitude they are of some interest.

As it has been demonstrated by Professor R. Tate in his report on an exploration into the Bunda Plateau, the older Tertiary deposits of this region rest on a Palæozoic basin, whose protuberances emerge above the overlying Tertiaries as far as can be seen at Yatala, Fowler's Bay, Pedinga, Ooldea, and Boundary

Dam, I should think that the outcrop of metamorphic rocks referred to above represents a continuation of this Palæozoic margin which there may have reached it furthest west, and turns thence down to Point Culver.

Concerning these protuberances, which are, according to the gentleman above quoted, granitic, such is not the case in the outcrop in question, though there is little doubt that this formation of the country referred to points strongly to a granitic substratum, which may even outcrop at no great distance from where we crossed that formation.

Taking it for granted that a line of such formation exists, extending from long. 125°, by Boundary Dam to Ooldea, it would form there, as has been hinted in a former chapter, another undulation of Azoic rocks running almost parallel to the one referred to in Section II., and furthermore this margin of the older beds would form a dividing line between two extensive subterranean basins, the one to the north forming a receptacle for the *Mesozoic* strata, sedimented in it with a fringe of Palæozoic rocks along the northern end, and the southern basin with the cainozoic sediments of the Bunda tableland.

Another, and far more extensive, Palæozoic country is represented by the Fraser Range.

Geographically speaking, this range is very limited, as the portion rising to a perceptible height is not more than 15 miles in length, and about six or eight miles in width, but geologically it extends over a wide area, slight undulations being only perceptible, but geognostically closely related to the Fraser Range.

This country was entered soon after leaving Camp 62, and the rocks comprising this formation were talcose and micaceous schists, feldspatic rocks, and chiefly siliceous slates and quartzites.

The main mass of the Fraser Range consists of hornblendic schists indistinctly stratified, and apparently representing an older underlying stratum of more distinct stratified siliceous rocks of the outlying portions (see fig. 12, pl. 5).

In one part of the range, namely, on the way to Simon's Hill from the Station Hut, an interesting occurrence of granitic dykes was observable. They are moderately high, with wall-like perpendicular sides running parallel to each other for a very long distance. As this granite is inclined to split in rectangular blocks, these dykes have the appearance of ruined walls of houses in a street in an ancient town. (See fig. 13, pl. 5).

Generally speaking, as regards eruptive rocks piercing the schistose formation of this eastern part of Western Australia, there were none met with of any extent or importance. The Fraser Range proper, which I inspected closely, exhibits only moderate signs of eruptive disturbances.

Besides those above-mentioned granitic dykes, only a few pegmatite protrusions were observed there. It remains to be observed here that also in this part of our journey two specimens of obsidian bombs were procured—one in the Great Victorian Desert amongst the sandhills, and one at the Fraser Range.

III.—MINERAL PROSPECTS.

Regarding the mineral prospects of this country, only the two Palæozoic patches are worth consideration here.

Concerning the one between Camps 52 and 54, it must be remembered that this, although a promising piece of country, is at present too far from any civilized place to be much thought of as a prospecting ground.

On the other hand, the Fraser Range and its highly mineralised surroundings afford the highest possible chances for being vigorously worked by prospectors.

It is situated only about 130 miles from the sea coast, from which a well-beaten road, with several wells, is available for the whole distance.

The range itself boasts, thanks to the energetic manner in which the owners of the place have improved their property, of many good wells, dams, &c., with abundance of splendid water.

This place could be made a kind of a centre, from where prospecting parties could start, and fall back upon if necessary, in case of want of water, &c.

The country north and north-east of this range is of a highly metalliferous character.

Even by the cursory inspection, which was all that was possible owing to our method of exploring, I was able to find any number of quartz-reefs, which I should have liked to examine more closely. Not only gold will be found in this country, but also other precious metals, as, for instance, silver, as there are highly-promising indications of it.

There are many big blows of manganiferous ironstone which, I should say, are well worth thoroughly testing.

Considering the fact that this metalliferous area is bordered to the north by the Hampton Plains, an excellent piece of country for pastoral and even agricultural purposes, it is a double recommendation towards attempting the opening up of the back lands of the Fraser Range, with a view of developing its mineral wealth.

IV.—SUBTERRANEAN WATER-SUPPLY.

As has been hinted above, the country between Fraser Range and Victoria Spring seems to be favoured with a moderately high rainfall, influenced by the relative proximity of the sea. In addition to this, the favourable physiographical conditions of this

area, viz., undulating stratification of the metamorphic bed-rocks, will render this country very promising for obtaining water by sinking wells down to the bed-rocks. A well near Simon's Hill, where this was done, proves that this method of obtaining water would be crowned with success in other places.

Concerning the waste track north of Queen Victoria Spring, although the conditions for subterranean, even artesian, water are favourable, on account of its geological and stratigraphical configuration, the question arises *cui bono?* should that task, although promising, be undertaken?

The greatest part of this sandy desert will remain for ever what it is now, an inhospitable, dismal stretch of country.

CHAPTER IV.

From the Fraser Range to the Yilgarn and Murchison Goldfields.

PHYSIOGRAPHICAL FEATURES.

This large area may be treated as one, on account of its geographical uniformity. It comprises an immense high plateau, which extends towards the west, far into the settled districts of Western Australia, terminating there in a steep escarpment, of which the Darling Range forms the most prominent feature. From a geological point of view this same stretch of country is sub-divided into several formations, of which the granitic and the flanking schistose are the most developed.

The height of this vast granitic tableland may be averaged, according to the barometrical measurements, at from 1,300 to 1,400 feet. The lower levels of this area are covered with immense saline sheets, which are generally surrounded by large alluvial flats and plains covered by nodular ironstone.

The plains are interrupted by bold eruptive granite-masses in low sandstone-capped ridges.

Rivers or creeks were not met with, and the big salt lakes (as Lefroy, Seabrock, Moore, Austin), appear to have no outlets, which fact accounts for the thick crust of salt with which they are covered.

The mountains and hills in this portion of the country cannot be said to boast of any great height or extension, as with the exception of the moderate outcrops of the elevated granite tableland which represent the main formation of the south and south-western part of West Australia; there are, as already mentioned, only low ridges of schistose rocks in the northern portion, which are often found in connection with flat-topped sandstone ranges.

The land surface of the country travelled over may in brief be

described as follows :—Proceeding from Fraser Range in a north-westerly direction, towards Lake Lefroy and the Hampton Plains, long-stretched ranges of metamorphic rocks were traversed. They have a general trend N.E. to S.W., and reach a height of 1,200 to 1,500 feet. Towards Lake Lefroy, between Camp 72 and Camp 76, wide claypans and salt lakes are found in the lower levels between the ridges. These salt lakes extend far towards the east, and are probably connected with the chain of salt lakes which were passed *en route* to the Fraser Range. The height of the smaller ones above sea-level is on an average about 900 feet, whilst the bed of Lake Lefroy is 1,000 feet above sea-level. All the salt-pans occupy boggy ground, and are therefore difficult to traverse, especially for heavily loaded camels. Most of them are bordered by low cliffs, consisting of a siliceous breccia of a secondary shore-formation.

Lake Lefroy, which has its inlets on the north shore, is on its southern side bordered by a line of hills of eruptive rock. The cover of salt is in places, viz., two to three inches thick ; but this extreme thickness I consider to be due to the accumulation of *drift salt*, an occurrence which was observed more distinctly at Lake Deborah, where considerable accumulations were heaped up on wind-protected places. North and north-east of Lake Lefroy the so-called Hampton Plains begin, which extend in that direction. This is a splendid stretch of country, a slightly undulating flat-land, rising only at Mount Monger and the neighbouring hills to a moderate height, about 1,700 feet above sea-level, or some 300 feet above the general level. The hills as well as the whole of the bed-rocks of the Hampton Plains consist of schistose rocks, with an abundance of quartz and ironstone lodes, the whole being traversed here and there by eruptive, mostly dioritic, dykes.

The soil is hereabout of an excellent quality, being a loam composed of the decomposition-products of the schist and plutonic rocks of the vicinity,

By travelling from here, Camp 76 (Hunt's Well), in an easterly direction towards Yilgarn, an entire change in the country was observed after passing the Depôt Hill of Hunt. Here the typical Western Australian granite-country was entered for the first time, *i.e.*, boundless flat country, either of hard sandy soil and covered with dense Eucalyptus forests, or strewn with gravels and clay-stones, and in this case covered with stunted vegetation. Through this sand-soil the underlying granite rises occasionally in large masses, and attains various heights from 300 to 400 feet above the plains (which are on an average 1,500 feet above sea level), thus breaking the monotony of the surface-contour.

From the western edge of the Hampton Plains to the immediate vicinity of Southern Cross, a distance of about 150 miles, the country is of this same character, except that in the latter portion the lower levels include many salt-covered lake basins and claypans. The lowest portion of this depression of 950 feet above sea-level was reached at Yilgarn, at the shore of Lake Deborah.

The Yilgarn Hills are a low range, their general direction being north and south, having along their eastern base a chain of salt lakes.

Near Yilgarn the auriferous schistose formation was entered again, and this by travelling towards N.N.W. was left shortly after our having passed Golden Valley.

After leaving the Yilgarn Hills, by proceeding in a N.N.E. direction the granite tableland once more appears. The sand and gravel plains begin again, with no other break than here and there high masses of eruptive granite.

This kind of country was found continuous (by travelling in a N.E. and N. direction) as far as Mount Kenneth, which means that for a distance of 125 miles the character of the country was the same.

Before reaching Mount Kenneth and its surrounding heights the Warne Flats were traversed—a fine piece of country, fit even for agricultural purposes.

Mount Kenneth is a table-topped sandstone cliff of moderate height, but of rather lengthened extent. There are several of these flat-topped hills noticeable towards N. and N.E., and also low, flat, sandstone-capped ranges, one of which was crossed before descending down to the Warne Flats (Camp 97-8).

Travelling from Camp 101 in a westerly direction schist country was again entered. Quartz and ferruginous quartz veins are very plentiful, and the country has a very promising appearance from a prospecting point of view. These schistose rocks strike N. and S., and the Canning Hills (Mr. Broad's Station) are the highest elevation of this formation.

From Broad's Station we travelled again north, or nearly so, and the country passed through was again sand plains and bold granite hills. At Jones's Station the schist country was touched again in Mount Magnet, it being the continuation of the Canning Hills to the North.

Between Jones's and Townsend's Station, which latter was reached afterwards (the two places being only some 50 miles apart), only granitic bed-rocks were met with, whilst to the east Lake Austin was visible, bordered by low, apparently schistose, hills. This latter formation was found outcropping again a few miles beyond Townsend's Station, and the low ranges composed

of this formation, still striking N.S., continue as far as Annean Station where they carry the Annean Reef, the first gold reef discovered on the Murchison.

DESCRIPTIVE GEOLOGY.

Fundamental Rock Structure.—Exclusive of the recent and superficial deposits, the general geological configuration of the country may be best described by assuming as foundation two massive masses of granite, forming slightly undulating high plateaux, which are bordered, one of them to the E., and one to the N. and E., by low hills composed of crystalline metamorphic rocks. One of these masses, the smaller, extends from the Yilgarn Hills to the east as far as the Depôt Hill of Hunt (near Camp 77), from which point eastwards the granite is overlain again by metamorphic rocks, which is probably the case also to the north and south. The other granite mass, the larger, extends from Yilgarn northwards as far as Townsend Station, and is flanked on the east by a belt of schistose rocks. How far this belt extends towards the east is not yet known, but if it should not be continuous I should think that slaty rocks *prevail* in this region just as the granites do to west of our route, where the slate formation, according to Mr. H. P. Woodward, Government Geologist in W.A., in his report on this country, and also according to Rev. W. B. Clarke, in his "Sedimentary Formations of N.S.W.," only occurs in patches.

Cainozoic Rocks.—The following recent formations to be found in this part of West Australia are:—

Sandy Plains.—These are the chief features of this tract of country, and they consist either of a fine loose sand, or, more frequently, of a hard loamy sand. In the latter case they give rise to splendid vegetation and high timber, whilst that on the first-mentioned kind is in every sense entirely useless. In the Murchison District the sand of these plains is found consolidated to such an extent that it can be used as a building stone. It is three to five feet under the surface where this recent sandstone is found in layers of five to ten feet in thickness, interstratified in places by a semi-opaline sinter, and almost invariably, and chiefly at a shallow depth, it is found to be water-bearing.

If freshly broken this sandstone is very friable, but hardens quickly by exposure to the air, a circumstance which points to the presence of a fair amount of calcareous matter besides silica. The sand forming these sand-plains may be taken as the derivative material of the "Desert Sandstone" which still covers vast tracts in the interior. Immense areas also are covered with sand and gravel, consisting of ferruginous sandstone and claystones. They have a widespread occurrence between the Lake Lefroy country

and Yilgarn, and also between Golden Valley and the country around Mount Churchman. They occur in belts or patches between the sand-plains, and are often 10 to 20 miles across. On account of the scarcity of vegetation, they represent a very dismal aspect.

The "*crust limestone*," or travertine, is of comparatively rare occurrence. It is limited to the beds of watercourses, and is found there only in very moderate thickness. In a creek near the Waterhall Mine, at Golden Valley, it was found exposed to a thickness of two feet.

Salt Lakes.—All over this portion of the country were encountered numerous and extensive, what are generally styled, "salt lakes," to which reference must here be made. In a former chapter I essayed to explain the terrestrial origin of some of the salt lakes in or near Mesozoic deposits; but such origin is not applicable to the salty claypans of the West Australian high plateau. There is little doubt that these large flats, covered with efflorescent salts, represent depressions of the granitic upland, in which the saline matter remaining from isolated, and in due course of time evaporated, parts of the ocean, has been accumulated. As they have no outlet at all, or only one at a very high water-mark, the saline matter remains, and a proof that this granitic upland has been raised from below the level of the sea, the widespread occurrence of the sandstone cappings of these granitic rocks may be adduced.

These wide lake-basins are surrounded either by large clay-flats or, as it was found in the southern portion of this section, by low cliffs consisting of a hard silicate of magnesia-rock. This formation signifies most likely ancient deposits of these lakes.

As a minor feature, may here be mentioned *deposits of guano* in caverns and rock-holes of the numerous granite rocks of this country, which have most likely accumulated there through bats and wallabies using them as shelter.

"Desert Sandstone."—As a transition to the older formations we may be regard the sandstone which caps the crystalline hills, especially in the more northern parts of this section. This formation was encountered firstly when descending towards the Warne Flats, which are bordered also to the east and north by hills of the same formation. This sandstone overlies directly the granite, and is invariably horizontally-bedded; its thickness varies from about ten to 200 feet on the hills round Mount Kenneth. As the lower portions of this sandstone are more inclined to weathering than the upper, these form overhanging escarpments, with numerous caves at the base of them. Big hungry-looking quartz-blows in these sandstone deposits occur frequently, being only infiltrations of siliceous matter, as they

are often found in sandstone country, and therefore, of course, of no value. Fossils were not found in this formation, but it is probably identical with the "desert sandstone" of the Northern Territory of Australia.

Palæozoic or Archæan Rocks.—The main components of the crystalline rocks are the hornblendic schists and slates in different varieties. They immediately overlie the granites, and are overlain by the feldspathic schists and quartzites of the same formation. In this order of superposition they were found outcropping by travelling in a north-easterly direction from Fraser Range, where they are well developed, and also eastwards of the Annean. As components of less importance of the same formation must be mentioned here talcose and micaceous schists, whilst on the other hand a siliceous ironstone, locally called "jasperoid," is constantly and largely developed in this series. The latter is a frequent occurrence in auriferous country. The quartzites occupy also a prominent position amongst the Palæozoic formation. They are mostly of a hard glassy character, with a bluish tint; the gritty variety though is also found, especially eastwards of Yilgarn. The quartzites and the underlying feldspathic and hornblendic schists seem to be comformably stratified, and are only in a small degree disturbed from their horizontal stratification.

Plutonic.—The immense area occupied by granites represents this formation. Wherever outcropping they bear a most distinct eruptive character. Of a dome-like form and of moderate height, say, on an average, about 200 feet, they often show signs of a macro-fluxional structure, the big curves formed by the white feldspar crystals being strikingly discernible. They are frequently traversed by quartz veins or dykes of a magma differently grained to the main mass, but these veins, of course, are of no importance from a prospecting point of view. A puffing up of big pieces, or a peeling off of scales of these granites, which is of common occurrence, may be due to the action of a sudden change of heat and frost, a dynamical factor of great importance in this country. Generally these granites are poor in plutonic intrusions, and if they occur, they are of a dioritic nature.

Plutonic and trappean rocks other than diorite are found in the country round Lake Lefroy. There diabase and diabase-porphyry occur. The Parker Hills, on the south shore of Lake Lefroy, are at their eastern end composed of the latter material, and the former form huge dykes in the above-mentioned country, also occasionally they appear rising in bizarre mases, through the basins of the salt lakes of this country.

The Canning Hills (Mr. Broad's Station) show signs of frequent plutonic intrusions, and deposits of detrital eruptive

material of considerable extent (porphyry and diabase tuffa) were also found there.

MINERAL PROSPECTS AND WATER SUPPLY.

From the foregoing account of the widespread occurrence of metamorphic rocks it will be readily and rightly concluded that this country is of a *highly promising metalliferous character*. An auriferous area extends from the Fraser Range northwards to the Hampton Plains, and as belts of the same material most probably border the granitic elevation between the Hampton Plains and Yilgarn to the south and north, this same formation will be found to extend as far as the latter country.

The area to N. and N.E. of Lake Lefroy, however, had the most promising appearance to me, and I may safely say that the country round Mount Monger will yet be famous as a goldfield. Northwards again, between Mount Kenneth and the Canning Hills, the same promising signs for the presence of precious metals were observable. It is a spur of the belt of metamorphic rocks extending northwards from Yilgarn. There, as well as further northwards towards the Murchison District, the gold-bearing character of this formation is known, and there is little doubt that it will prove so all along this belt of metamorphic rocks.

In regard to the granitic country, there is no likelihood of minerals or metals being found there, but as these probably represent the hard lower portions of this formation which will, no doubt, be overlaid by softer metamorphic granites forming the transition to the true metamorphic schists of this area, there is, if these be found, a chance of encountering also metalliferous veins in them. Unfortunately the prevalence of the abundant covering of sands and loams encompasses these over-lying softer portions and renders prospecting for them almost impossible.

Water.—The uncertainty, however, of obtaining valuable water-supplies presents a less pleasant outlook. In the northern portion of this section there is a fair amount of water, although sometimes brackish, to be obtained by shallow sinking in the alluvials. The settlers of the north-eastern district have already been successful in this respect, and this will be the only practicable method for that purpose. In the southern portion, however, though having a higher annual rainfall than the northern, the conditions for obtaining water in the alluvial deposits are less favourable, but as there are a number of granite bosses, which afford favourable sites for constructing dams, this method will have to be applied, in addition to sinking wells in the immediate vicinity of these rocks, where water will often be found stored in subterranean receptacles formed by the granites.

In the whole of this section there is, of course, not the slightest chance of obtaining water on the artesian principle.

CHAPTER V.

LIST OF ROCK AND MINERAL SPECIMENS

I. Specimens characterising the rocks comprising Mount Chandler and vicinity. May 29-31, 1891. (Palæozoic Devonian).

II. Chief rocks of the formation between Cootanoorina and Arcoellina. May 3-25, 1891. (Cretaceous).

III. Specimens of the most prominent recent bed rocks between Warinna and Cootanoorina. May 2-3, 1891.

1A. *Hornblendic granite.* Main mass of Everard Range. June 2, 1891.

1B. *Epidote-diabase.* Forming dykes in Everard Range. June 4, 1891.

1C. *Granite.* Low ranges surrounding the Everard Range. June 3, 1891.

1D. *Travertine-limestone.* Gullies and Watercourses. Everard Range. June 4, 1891.

1E. *Epidote.* Small veins in granite mass of Everard Range. June 3, 1891.

1F. *Diorite.* In huge masses west of main mass of Everard Range. June 6, 1891.

1G. *Diorite* Dykes in granite hills S.W. of Everard Range. June 6, 1892.

1H. *Diorite,* from small veins intruding the lower parts of main mass of Everard Range. June 6, 1891.

1I. *Siliceous sinter.* Gullies and watercourses in Everard Range. June 5, 1891.

1K. *Semi-opaline sinter.* Gullies and watercourses of Everard Range. June 4, 1861.

1L. *Specimen of œolian-eroded surface of granite rock.* Everard Range. June 4, 1891.

IV. *Specimens* collected by Messrs. Lindsay and Helms on *flying-trip* south from Camp 4. June 15, 1891.

(*a*) Within Camp 4 and 12 miles.
(*b*) Within 12 and 30 miles.
(*c*) Within 30 and 50 miles.

2. *Granite, metamorphic.* Rocks and boulders west of Everard Range. June 7, 1891.

3. *Travertine breccia.* Tavertine rubble and quartz cemented by red travertine. Eight miles west of Camp 1. June 7, 1891.

4. *Granite.* Twelve miles west of Camp 1. June 7, 1891.

5. *Travertine-limestone.* Eight miles west of Camp 2, forming banks along Ferdinand Creek. June 8, 1891.

6. *Black travertine* stained with absorbed vegetable matter. June 8, 1891, near Ferdinand Creek.

7. *Sand* from the Ferdinand Creek. June 8, 1891.
8. *Metamorphic hornblendic rock* (decomposed). Ten miles west of Camp 2. Overlaid by travertine-lime. June 9, 1891.
9A. *Nodular* and *tabular limestone*. Five miles west of Camp 3. Terraces along Ferdinand Creek. June 9, 1891.
9B. *Travertine*, partly replaced by opal-quartz and opal. Near depôt Camp 4. On base of granite rocks. June 10, 1891.
10. *Gneissic granite*. Low hill two miles N.W. of Camp 4. June 10, 1891.
10A. *Granite*. Same locality. June 10, 1891.
10B. *Diorite*, piercing granite. N.W. same locality. June 10, 1891.
11. *Granite* (decomposed). Small hills between Camps 4 and 5. June 18, 1891.
11A. *Diorite*. Same locality as No. 11. June 18, 1891.
11B. *Travertine* (including debris of rocks). Base of small granite hills between Camp *s*4 and 5 June 18, 1891.
12. *Quartz, hornblende, felspar*. Small veins in granite hills between Camps 4 and 5. June 18, 1891.
13. *Lodestone* (lode five feet wide). In granite hills between Camps 4 and 5. June 18, 1891.
14. *Travertine*. In banks running N.S. escarpment E. Between Camps 5 and 6. June 19, 1891.
14A. *Chalcedony*. Embedded in travertine (14). June 17, 1891.
14B. *Travertine*, with absorbed organic matter. Banks between Camps 5 and 6. June 19, 1891,
15. *Diabase*. Intersecting a diorite outcrop. Nine miles west of Camp 6, June 22, 1891.
16. *Guano-incrustation* of rock-holes (bats). Granite rocks near Camp 6. June 22, 1891.
17. *Diorite*. Low hills near Camp 9. June 24, 1891.
17A. *Epidote*. Intersecting low diorite hills near Camp 9. June 24, 1891.
18. *Felspathose grit*. Faulted country near Camp 10. June 29, 1891.
19. *Veinstone*. Five miles east of Camp 11. Low range. June 29, 1891.
20. *Quartzite*. "Coffin" Hills, near Camp 12. June 30, 1891.
21. *Travertine*, as cement of gravel conglomerate. Two miles N.W. from Camp 12. July 2, 1891.
22. *Granite*, with *travertine*-incrustation. Low Granite Range. Camp 14. July 4, 1891.
23. *Gneissic granite*. Birksgate Range and surroundings. July 12, 1891.
24. *Epidote-granite*. Birksgate Range. July 8, 1891.
25. *Quartz-lode*. In Mount Sir Thomas. July 17, 1891.

25A. *Felspathose rock*, with *quartz-vein*. Low Range. Camp 14. July 4, 1891.
26. *Diorite* (hornblende-rock). Small veins in granite of Mount Sir Thomas. July 12, 1891.
27A. *Granite*. Lowest stratum of Turban Hill. July 7, 1891.
27B. *Granitic rock*, with embedded subangular granite debris. Same hill, second stratum.
27C. *Quartz* pebbles of a conglomerate. Same hill, third stratum.
27D. *Silico-felspathic rock*. Same hill, fourth stratum.
27E. *Ferruginous quartzite*. Same hill, fifth stratum. July 7, 1891.
27F. *Whitish quartzite*. Turban Hill, top layer. July 7, 1891.
28. *Argillaceous travertine*. Gullies of Birksgate Range. July 12, 1891.
28A. *Gypseous clay*. Gullies of Birksgate Range. July 12, 1891.
29. *Binary granite* (microcryst. quartz, microcryst. felsp.). Sawback Hill (Mount Gosse?) July 17, 1891.
30. *Travertine*. From Boundary Hill (Mount Gosse). July 18, 1891.
31. *Granite*. From Boundary Hill. July 18, 1891.
31A. *Eurite*. From Boundary Hill. July 18, 1891.
32. *Scaly quartzite* (lustre due to minute laminæ of mica. Grinding-stone of blacks not found in situ). July 20, 1891.
33. *Porphyritic syenite*. Main mass of Skirmish Hill. July 21, 1891.
33A. *Porphyrite*. Dykes in Skirmish Hill. July 20, 1891.
33B. *Porphyrite*. Intrusions in Skirmish Hill. July 20, 1891.
34. *Porphyritic tuffa*. Surroundings of Skirmish Hill. July 20, 1891.
34A. *Porphyry-breccia*. Base of Skirmish Hill. July 20, 1891.
34B. *Porphyry-claystone*. Base of Skirmish Hill. July 20, 1891.
35. *Agate*. In porphyry rocks of Skirmish Hill. July 20, 1891.
35A. *Semi-opal*. From Skirmish Hill. July 20, 1891.
35B. *Quartz crystals*. Skirmish Hill. July 20, 1891.
36. *Specimens* of rocks from a *flying trip* towards south collected by Mr. L. Wells. July 25, 1891.
37. *Porphyritic diabase* and *quartz* vein intersecting the diabase. Western parts of Skirmish Hill. July 26, 1891.
38. *Diorite*. Main mass of Cavenagh Range. July 29, 1891.
39. *Diorite* (bell-rock). Cavenagh Range. July 29, 1891.
39A. *Aphanitic diorite*. Cavenagh Range. July 30, 1891.
39B. *Quartz-epidosite*. Cavenagh Range. July 30, 1891.
39C. *Aphanite*. Cavenagh Range. July 30, 1891.
39D. *Felspar*, with specks of *hornblende* (vein forming material) Cavenagh Range. July 29, 1891.

39E. *Semi-opal*, with *hornblende* (small veins). July 29, 1891.
39F. *Quartz*, as lode in hornblende rock. Cavenagh Range. July 29, 1891.
40. *Tachylite*. Mount Cooper, Cavenagh Range. July 31, 1891.
41A. *Granulite*. Ten miles east of Camp 33, Barrow Range. August 3, 1891.
41B. *Granulite* (gneissic structure). Ten miles east of Camp 33. August 3, 1891.
42. *Syenite* (semi-porphyritic structure). Main mass of Mount Squires, Barrow Range. August 5, 1891.
42A. *Quartz*, lode in syenite of Mount Squires. August 5, 1891.
43. *Diabase*. Mount Squires, Barrow Range. August 5, 1891.
44. *Ferruginous sandstone*. South-west side of Mount Squires. August 5, 1891.
45. *Specimens* from the *Warburton* Range and *Elder* Creek, D. Lindsay. August 10, 1891.
46. *Specimens* from a *flying trip* in Gibson's Desert, F. W. Leech. August 10, 1891.
47. *Felstone*, from a dyke in Mount Squires. August 26, 1891.
48A. *Syenite*, from Mount Squires. August 29, 1891.
48B. *Porphyry-syenite*, from Mount Squires. August 29, 1891.
48C. *Epidosite*, as lode intersecting 48B. August 29, 1891. Mount Squires.
49. *Felstone-porphyry*. As dykes in Mount Squires. September 1, 1891.
49A. *Quartzose diabase*. South side of Mount Squires. September 1, 1891.
50. *Quartzite*. From Townsend Ridges. September 2, 1891.
50A. *Quartzose grit*. From Townsend Ridges. September 2, 1891.
50B. *Argillaceous sandstone*, with mica lamells. Terraces near Camp 40 (waterhole). September 4, 1891.
50C. *Ferruginous sandstone*. Same locality as No. 50B. September 4, 1891.
50D. *Travertine*. Covering the ferruginous clay sandstone. Same locality. Camp 40. September 4, 1891.
51. *Quartz-pebbles*. As layers in terraces crossed between Camps 40 and 41. September 5, 1891.
51A. *Quartzite*. Ridges between Camps 40 and 41. September 5, 1891.
51B. *Clay* (indurated). Top stratum of ridge between Camps 40 and 41. September 5, 1891.
51C. *Sandstone*, with siliceous cement. Between Camps 40 and 41. D. Lindsay. September 5, 1891.
51D. *Clay*, enclosing minute mica lamells. Ridge between Camp 40 and 41. September 5, 1891.

52. *Argillaceous cement*, of a quartz-breccia. Between Camps 43 and 44. September 9, 1891.
53. *Sand concretions.* Desert between Camps 40 and 50.
53A. *Jasperite* and *quartz.* Between Camps 47 and 48. September 10, 1891.
53B. *Micaceous sandstone.* Outcropping between Camps 47 and 48. September 10, 1891.
54. *Calcareous tuffa.* From an extinct mound-spring, between Camps 52 and 53. September 11, 1891.
54A. *Carbonaceous travertine.* Between Camps 52 and 53. September 11, 1891.
54B. *Nodular limestone.* Between Camps 52 and 53. September 11, 1891.
55. *Quartz-pebbles.* Between Camps 53 and 54. September 12, 1891.
55A. *Porcellanised sandstone.* Cliffs between Camps 53 and 54. September 12, 1891.
55B. *Obisdian bombs.* Found in Great Victoria Desert. September 1, 1891 ; October 2, 1891.
56A. *Gneiss*, with garnets. Between Camps 53 and 54. September 15, 1891.
56B. *Mica-schist.* Between Camps 53 and 54. September 15, 1891.
56C. *Pegmatite.* Between Camps 53 and 54. September 15, 1891.
56D. *Breccia.* Formed by rubble of aforesaid rocks. Between Camps 53 and 54. September 15, 1891.
56E. *Felspar*, out of a *pegmatite.* Between Camps 53 and 54. September 15, 1891.
57. *Micro-oolitic travertine.* Between Camps 54 and 55. September 16, 1891.
58. *Clay.* From the bottom of Queen Victoria Spring. September 24, 1891.
59. *Sandstone* and *conglomerate*, with *loess.* Cover forming the hills south-west of Victoria Spring. September 25, 1891.
60I. *Hornblendic granite.* Between Camps 61 and 62. September 28, 1891.
60Ia. *Syenite.* Between Camps 61 and 62. September 27, 1891.
60I. *Quartz veins* in schistose rocks. Between Camps 61 and 62. September 27, 1891.
60Ia. *Talcose schist.* Between Camps 61 and 62. September 27, 1891.
60A. *Felspathic rock*, highly decomposed (No. 60B.). Between Camps 61 and 62. September 27, 1891.
60B. *Granitite* (felspathic rock, binary granite). Between Camps 61 and 62. September 27, 1891.

61. *Siliceous slate* (lydite). Between Camps 63 and 64. September 29, 1891.
61A. *Grit rock.* Between Camps 63 and 64. September 28, 1891.
61B. *Siliceous sand-conglomerate* (first state of weathering of 61A). Between Camps 64 and 65. September 30, 1891.
61C. *Siliceous conglomerate* (second state of decomposition of 61A). Between Camps 64 and 65. September 30, 1891.
62. *Gravel and gravel-conglomerate.* Great Victoria Desert. September 2, 1891 ; September 25, 1891.
63. *Limestone nodules.* Between Victoria Spring and Fraser Range. September 25, 1891 ; October 1, 1891.
64. *Magnesite.* Found amongst the lime-nodules. September 28, 1891.
65. *Semi-vitrified sand.* Deposited by white ants in hollow trees. September 30, 1891.
66. Vacat.
67. *Garnetiferous gneiss.* Symonds Hill, Fraser Range. October 15, 1891.
67I. *Hornblendic schist.* Main mass of Fraser Range. October 15, 1891.
68. *Garnetiferous Mica-schist.* North of Fraser Range. October 15, 1891.
68I. *Quartz in veins.* West side of Fraser Range. October 16, 1891
68$_2$. *Quartz* from a *Pegmatite* gangue. Western parts of Fraser Range. October 16, 1891.
69. *Limonite.* North parts of Fraser Range. October 16, 1891. Cap of lode.
69I. *Specularite.* Cap of lode. North of Fraser Range.
69$_2$. *Psilomelane.* Cap of lode. North of Fraser Range. October 16, 1891.
70A. *Felspar* in *pegmatite*, Kangaroo Hill. Fraser Range. October 16, 1891.
70B. *Mica* in *pegmatite*, Kangaroo Hill. Fraser Range. October 10, 1891.
71. *Argillaceous slate.* Between Camps 70 and 71. November 3, 1891.
72. *Hornblendic slate.* Betwcen Camps 70 and 71. November 3, 1891
72A. *Quartz* as lode in schistose rocks. Between Camps 70 and 71. November 3, 1891.
73. *Gneiss.* Between Camps 70 and 71. November 3, 1891.
74. *Indurated hornblendic slate.* Between Camps 70 and 71. November 4, 1891.
75. *Talcose gneiss* (sericit gneiss ?). Near waterhole between Camps 71 and 72. November 11, 1891.

75. *Decomposed gneissic rock.* Same locality. November 4, 1891.
75A. *Siliceous conglomerate.* Cliffs near salt lake, between Camps 72 and 73. November 5, 1891.
75B. *Ferruginous quartz-conglomerate.* Low cliffs along a salt lake, between Camps 72 and 73. November 5, 1891.
75C. *Diabase.* Dykes outcropping in a salt lake between Camps 72 and 73. November 5, 1891.
76. *Diabase.* Specimen of æolian erosion. Chain of salt lakes between Camps 72 and 73. November 5, 1891.
76A. *Siliceous breccia.* Found on shore of small salt lakes between Camps 72 and 73. November 5, 1891.
76B. *Argillaceous sandstone.* Forming a cliff between Camps 73 and 74. November 6, 1891.
77. *Clay* from the bottom of Lake Lefroy; south shore. November 7, 1891.
77A. *Siliceous limonite.* South shore of Lake Lefroy. November 7, 1891.
78. *Efflorescent salts.* Lake Lefroy. November 7, 1891.
79. *Diabase.* South shore of Lake Lefroy, Parker Hills. November 7, 1891.
79A. *Diabase-porphyry.* Parker Hills. November 7, 1891.
79B. *Hornblendic gneiss.* Parker Hills. November 7, 1891.
80. *Indurated hornblendic slate.* Mount Monger and Hunt's Well. November 8, 1891.
81. *Hornblendic schist.* Ranges between Camps 75 and 76. November 8, 1891.
82. *Granite.* Outcropping in big boulders between Camps 76 and 84. November 11-19, 1891.
83. *Gravel*, consisting of a quartzose conglomerate and claystones. Between Camps 80 and 82. November 15-16, 1891.
84. *Quartzose grit*, forming the material for the gravel. Near Mount Caroline. November 17, 1891.
84A. *Quartz* in veins and layers between the grit. Near Mount Caroline. November 17, 1891.
85. *Siliceous schist.* Between Camps 84 and 85. November 11, 1891.
86. *Hornblendic slate* country rock of auriferous lodes at Southern Cross, Yilgarn. November 20, 1891.
86A. *Semi-opal* from Fraser's South Mine. Presented by Captain Oats.
86B. *Tungsten ore.* Found in Fraser's South Mine. Captain Oats.
86C. *Auriferous quartz* from the Central Mine. Presented by Captain Nicholls.
86D. *Auriferous quartz*, from the Central Extended Mine. Presented by Captain Rodgers.

86E. *Wulfenite*, from the Central Extended Mine. Presented by Captain Rodgers.
86F. *Auriferous quartz*, from Hope's Hill Mine, Yilgarn.
86G. *Steatite*, from Hope's Hill Mine (Mr. Dreyer), Yilgarn.
86H. *Molybdenite*, from Hope's Hill Mine, Yilgarn.
86I. *Kaolin* (auriferous), Hope's Hill Mine, Yilgarn.
87. *Hornblendic schist.* Golden Valley, Yilgarn. December 2, 1891.
87A. *Hornblendic slate.* Golden Valley. December 2, 1891.
87B. *Jasper* (highly ferruginous quartz). Dykes and leaders at Golden Valley. December 2 1891.
87C. *Auriferous quartz*, from Katherine Mine, Golden Valley. December 2, 1891. Presented by the Captain.
87D. *Auriferous quartz*, from the Waterhole Mine, Golden Valley. December 2, 1891. Presented by the Captain.
87E. *Quartz with pyrites*, from the lowest level (150) of Katherine Mine. December 2, 1891.
87F. *Hornblende.* Presented by Mr. Huggins, of Golden Valley.
87G. *Travertine.* Ground in creek-bed of Golden Valley. Decem ber 2, 1891.
87H. *Argillaceous limestone* (travertine) in cracks and crevices of Catherine Mine, Golden Valley. December 2, 1891.
88. *Bat guano.* In caves of a granite rock near Camp 89, Lake Deborah. November 5, 1891.
89. *Auriferous quartz* from Ullaring. Presented by Mr. Speck-mann, of Golden Valley.
90. *Quartzite.* Rocks near Camp 94. December 11, 1891.
91. *Siliceous clay*, resulting from weathered granite rocks near Camp 94. December 11, 1891.
92. *Siliceous sinter.* Covering granite rocks near Camp 94. December 11, 1891.
93. *Argillaceous sandstone.* North of Mount Churchman, Camp 98. December 15, 1891.
94. *Sandstone.* Near Camp 99. December 16, 1891.
95. *Decomposed gneissic rock.* Between Camp 94. December 16, 1891.
96. *Augite-schist.* Near Camp 101 (Mount Kenneth). December 20, 1891.
97. *Schaalstein (porphyry tuffa).* Ten miles west of Mount Kenneth. February 21, 1891.
98. *Diabase* (decomposed). Between Camps 103 and 104, Can-ning Hills. December 12, 1891.
98A. *Ferruginous quartzite-slate.* Canning Hills. December 22, 1891.
99A-C. *Hornblendic slates* (different states of decomposition). Canning Hills. December 22, 1891.

100. *Decomposed metamorphic schist.* Canning Hills. December 22, 1891.
101. *Decomposed metamorphic rock.* Canning Hills. December 22, 1891.
102. *Indurated slate.* Ten miles N.W. of Townsend Station, Murchison Goldfield. January 2, 1892.
103. *Hornblendic slate.* Camp 111. January 2, 1892.
104. *Opaline sinter.* Twenty-two Miles Well, near Cruikshank's Station. January 3, 1892.
105. *Sand conglomerate.* Near Cruikshank's Station, Annean; Camp 113. January 3, 1892.
106. *Asbestos,* from Mt. Magnet. Presented by Mr. T. C. Simpson. December 1, 1892.
107A. *Gold quartz,* from the Nannine Mine, Murchison goldfield. Presented by Mr. McPherson, discoverer of the field. January 13, 1892.
107B. *Jasperite* (ferruginous quartzite). Murchison Goldfield.
107C. *Decomposed slaty rock.* Murchison Goldfield.
107D. *Hornblendic slate.* Murchison Goldfield.
107E. *Talcose slate.* Murchison Goldfield.
107F. *Micaceous schist.* Murchison Goldfield.
107G. *Amphibole schist.* Murchison Goldfield.
107H. *Mica slate.* Murchison Goldfield.

N.B.—A complete collection of the above was presented to the School of Mines, Adelaide, and a nearly complete collection to each of the following institutions:—Geological Museum, Perth; Royal College of Science, London; and Mining Academy, Freiberg.

SUPPLEMENTARY NOTES ON THE ABOVE-NAMED COLLECTION.*

By A. W. Stelzner, Professor of Geology and Palæontology, of the Royal Saxon Academy of Mines at Freiberg.

Mr. Victor Streich, Adelaide.

Dear Sir—According to your desire, I submit to you my opinion on the rock specimens collected by you, especially on those which require, according to my opinion, a different determination as given by you on the labels.

"1B. *Epidote Diabase.* Everard Range, occurring in dykes." It is probably one of those mixtures consisting of quartz and

* Received since the above list was printed.—[Ed. 13/3/93.]

epidote which occurs frequently in crevices of granites and syenites, and which are to be taken as a product of lateral segregation of these rocks.

"1G. *Diorite*, in huge masses west of main mass of Everard Range." According to the microscopical examination of the prepared rock-section, quartzose diabase of ophitic structure; quartz is only present in small quantities. As an accessory constituent is to be mentioned apatite. The same applies to 1H.

"8. *Metamorphic hornblendic rock*. Ten miles west of Camp No. 2." Is gneiss.

"10B. *Diorite*. Protruding low granite hills two miles north-west of Camp No. 4." Is quartzose diabase. Plagioclase and quartz show partly granophysic structure. Some biotite is also present.

"11A. *Diorite*. Low hills between Camps 4 and 5." Is olivine diabase.

"17. *Diorite*. Low hills near Camp 9." Is very compact olivine diabase.

"22. *Felspathose rock*. Low range, Camp 14." Is a very fine granular granite.

"26. *Diorite*. Small veins in granite of Mount Sir Thomas." Is diabase poor in olivine.

"33A. *Porphyrite*. Dykes in porphyritic syenite, Skirmish Hill." There are in the principal matrix of this rock porphyritic orthoclase crystals. As the petography of to-day applies the word porphyry only to porphyritic rocks containing plagioclase, the term felsite-porphyry would be more appropriate.

"39. *Diorite* (Bell rock). Cavenagh Range." Is according to the result of microscopical examination of the prepared rock section a very compact olivine diabase.

"40. *Tachylite*. Mount Cooper, Cavenagh Range." This rock is of such an extremely fine grain, that I can not determine it, even with the aid of the microscope on rock sections.

"41A. *Granulite*. Ten miles East of Camp 33, Barrow Range." This rock resembles so closely the granulite of the Saxon granulite-ellipsis, that it could have been found there as well!*

"47. *Felstone*. Mount Squires." Felsite-porphyry (*vide* N. 33A).

"48. *Epidosite*. Intruding as veins, the syenite of Mount Squires." These veins are results of lateral-segregation (like 1B), and can not be looked upon as special rock formations. The same is to be said about N. 49 and N. 49A. (quartzose diabase). In the syenite of the Plauenshe Grund near Dresden these small segregation-veins are of constant occurrence.

*Herman Credner, Erlaeuterungen der geol. Special—Karte von Sachsen, Sectionen Geringswalde, Glauchau, Rochlitz, Waldheim.

"49. *Feldstone-porphyry.* Dykes in Mount Squires." Accord- to the prepared rock section a true felsite-porphyry.

"53B. *Micaceous sandstone.* Outcropping between Camp 47-48." According to its lithological character, I should call it micaceous schist.

"55B. *Obsidian-bombs.* Found between Everard Range and Fraser Range." Most decidedly not of cosmic origin, as suggested by you in your private letter to me. At least, so far there are no vitreous masses known to me of meteoric origin. According to their shape, I feel inclined to pronounce them as waterworn, and I should think that the obsidian, from which they are derived, will be found yet *in situ.* I cannot say anything more about them without any knowledge of their occurrence.

"56A. *Gneiss with garnets.* Between Camps 53 and 54." The specimen submitted to me is free from felspar, and, therefore, micaceous schist.

"67I. *Hornblende-schist.* Main mass of Fraser Range." Is, according to the microscopical examination of the rock section, an undecomposed diabase, which is distinguished on account of its containing highly pleochroitic augite and biotite and apatite as accessory components.

"72. *Hornblendic slate.* Between Camps 70 and 71." In consideration of the microscopical examination of a section of this rock, to be pronounced as amphibolite.

"75C. *Diabase.* Dykes in salt lake between Camps 72 and 73." Like 72, and therefore not an intrusive rock.

"80. *Indurated hornblendic slate.* Mount Monger and Hunt's Well." Is indurated argillaceous slate.

"87F. *Hornblende.* Golden Valley." Is fibrous tourmaline, as ascertained by the microscope and the blowpipe (containing boracic acid).

"96. *Augite-schist.* Near Camp 101, Mt. Kenneth." According to the microscopical examination, rather diorite, which contains, probably as a secondary formation, small quantities of quartz and epidote.

"107B. *Micaceous schist.* Murchison Goldfield." Contains felspar, and therefore to be called gneiss.

Without any knowledge of the formation and occurrence of the rock specimens submitted to me, I am not able to give any geological notes on them. I have, therefore, limited myself to these few petrographical notes, and I hope and wish that they will be of some use to you.

Yours obediently,

A. W. Stelzner.

APPENDIX.

LIST OF ROCK SPECIMENS

COLLECTED BY MR. WELLS ON A JOURNEY EAST FROM MURCHISON GOLDFIELD, DETERMINED BY PROFESSOR TATE.

Sandstones.

30. Fine sandstone. March 19, 1892.
31A. Coarser siliceous sandstone. March 22, 1892; lat. 26° 47′, long. 123° 13′.
32. Coarser siliceous sandstone. March, 24, 1892.
33B. Sandstone (laminated). March 24, 1892.

Quartzites.

2A. Schistose quartzite, banded with hæmatite. February 26, 1892.
2B. Schistose quartzite, banded with hæmatite. February 26, 1892.
19. Quartzite. March 8, 1892.
42. Quartzite. April 2, 1892.
26. Banded quartzite. March 12, 1892.
40A. Banded quartzite. March 31, 1892.
34. Quartzite, with cavities containing ilmenite. March 27, 1892; lat. 26° 26′, long. 121° 50′.

Clays.

20. Decomposed clay-slate. March 8, 1892.
22. Impure kaolin. March 8, 1892.
30. White siliceous mudstone. March 19, 1892.
33C. White hard slate. March 24, 1892.
38. Decomposed clay-slate. March 30, 1892; lat. 26° 30′, long. 120° 52′.

Ironstones, &c.

17. Ironstone. March 7, 1892.
23. Ironstone, limonite. March 9, 1892.
31. Siliceous ferro-mudstone. March 22, 1892.
36. Ironstone gossan. March 28, 1892.
6D. Agglomerated hollow spheroids of siliceous limonite (concretionary). March 1, 1892.

Flints.

21B. Chert. March 8, 1892.
40B. Chert. March 31, 1892.

Vein Quartz.

3A. Vein quartz. February 27, 1892; lat. 27° 20′, long. 120° 10′.
4. Vein quartz. February 29, 1892.
6A. Vein quartz. March 1, 1892.
6B. Vein quartz. March 1, 1892.
6C. Breccia of vein quartz with limonite-cement. March 1, 1892.
10A. Vein quartz. March 5, 1892.
11A. Vein quartz. March 5, 1892.
11B. Breccia of vein quartz with limonite-cement. March 5, 1892.
14. Vein quartz. March 6, 1892.
27A. Auriferous quartz. March 12, 1892.
11C. Vein quartz. March 5, 1892.
27. Vein quartz. March 12, 1892.

Grits, &c.

1. Sharp quartzitic grit (probably derived from waste of granite). February 25, 1892.
3B. Coarse grit. Same nature as 1. February 27, 1892.
9. Foliated felspatho-quartzose grit. March 4, 1892.
10B. Ferruginous quartzose grit. March 5, 1892.
12. Conglomerate of small quartz-pebbles. March 5, 1892.
16. Decomposed quartzose felstone. March 7, 1892; lat. 27° 34′, long. 121° 47′.
18. Conglomerate of small quartz-pebbles, with smaller grains. March 7, 1892.
21A. Quartzitic grit. March 8, 1892.
24. Sharp quartzitic grit (probably derived from waste of granite). March 10, 1892.
33A. Sharp quartzitic grit (probably derived from waste of granite). March 24, 1892.
39. Conglomerate of small quartz-pebbles. March 31, 1892.

Granulites, &c.

25A. Granulite. March 11, 1892.
25B. Granulite. March 11, 1892.
28. Granulite, passing to granite. March 13, 1892.
29. Granulite. March 13, 1892.
35. Decomposed macro-granulite. March 27, 1892; lat. 26° 26′, long. 121° 50′.
37. Decomposed granulite. March 30, 1892.
41. Decomposed macro-granulite. March 31, 1892.

Diorites.

5. Gabbro. March 1, 1892.
13. Diorite. March 6, 1892.

Miscellaneous.

6E. Hornblende-schist. March 1, 1892.
27B. Micaceous schist, decomposed. March 12, 1892.
7. Wood asbestos. March 1, 1892.
15. Travertine. March 6, 1892.

N.B.—A complete collection of the above was presented to the School of Mines, Adelaide.

METEOROLOGY.

By VICTOR STREICH,

Geologist to the Expedition.

Notes re Meteorological Record.—A description and enumeration of the meteorological instruments employed being unnecessary, it remains here only to say a few words about the method of observing, and also a few remarks as to the occasional observations of meteorologically interesting phenomena. The hours of observation were 9 a.m., 3 p.m., and 9 p.m. The last-mentioned hour, however, could not be kept during the earlier stages of the journey, owing to the early hour at which the camp retired for the night. The instruments themselves were read according to the instructions given by Mr. Todd, C.M.G., in the handbook for the officers. Concerning the completeness of the register, every effort was made to keep it regularly posted; but from unavoidable causes, such as difficulties in travelling usually met with, or geological researches of an engrossing nature receiving particular attention at the hour for observation, several blanks in the register were necessitated. The entries in the register state the simple reading-off of the instruments, no corrections or reductions of any kind have been made on them. The observations have been all made by myself, except from the 10th to the 15th January, 1892, at the Annean Station, Murchison, where, during my absence on a flying trip to the neighbouring goldfields, Mr. Helms had the goodness to keep the meteorological register, I having satisfied myself from previous trials that our methods of observing were alike. As it will be noticed, more elaborate observations were made when in stationary camps (October, 1891, Fraser Range), and also that a kind of "term observations" were made on the 21st of each month, at least whenever possible. It will be found stated in the register (under the heading "Remarks") when observations were made in camp or *en route*. The barometrical readings when *en route*, of course, cannot claim to be of great importance as *meteorological* observations, as the height when read-off at the aforesaid hours differed sometimes considerably. Unfortunately a great number of thermometers had to be sacrificed for the sake of science, as all thermometrical observations were read off after swinging, and to swing a thermometer on camel back without accident in a dense Australian bush is by no means an easy matter. Fortunately, however, the supply was sufficient to prevent the loss of any records in the register.

Occasional Observations.—Short entries have been made in the register; but it will be serviceable to give here a more exhaustive description of them.

Zodiacal Lights.—These were developed with a remarkable degree of distinctness, especially from August to December, and were visible about half an hour after sunset. Under favourable circumstances, not only was the well-known glowing pyramid to be seen in the west ,but also a smaller and less distinct one rising over the eastern horizon. The connecting bridge, however, between these two, which is said to be visible in dry, tropical, as also sub-tropical regions, could not be discerned, neither was a zodiacal light ever to be seen before day-dawn.

Meteors.—These phenomena were frequently observed all through. At the end of the month of July, and at the beginning of August, however, they were more numerous than at any other time. The radiative point of the "Swarm" was situated in the northern portion of the sky. Another less prominent flock of meteors was observed on the 21st December, its radiative point lying apparently in the southern part of the firmament.

Irridescent Clouds.—A splendid phenomenon was observed on the 29th December, 1891. A stratus cloud partly cirrial covering the sun, shone in splendid rainbow colours, green and violet being the most conspicuous. It lasted for about two minutes, and the cloud being the only one disappeared suddenly at the expiration of about that time. It occurred at 1.20 p.m., temperature being at the time about 104°, wind slight, in a south-westerly direction.

Surface Temperature.—Careful observations were also taken to ascertain the nocturnal decrease in temperature of the surface of the earth, and the temperature of the air. This was done in the undermentioned way, and read-off in the morning before sunrise. For that purpose three thermometers were used, one being fixed about six inches above the ground, the next two feet and a half, and the third five feet, and the following results were obtained:—

(1) *Birksgate Range.*—Camp surrounded by high granite ranges, and well protected from winds. Immediately above the ground, 37½° ; 2½ ft. above ground, 39° ; 5 ft. above ground, 40° F.

(2) At *Skirmish Hill.*—Camp in a fairly open plain, on the east side of the hill, about half a mile away. Six inches above ground, 23° ; 2 ft. above ground, 24·5° ; 5 ft. above ground, 26° F.

(3) At *Barrow Range.*—Camp in an open plain, only a few granite rocks some 100 yards off. Six inches above ground, 25° ; 2½ ft. above ground, 28° ; 5 ft. above ground, 30° F.

The great difference of the three readings of the last observa-

tion is probably due to the unprotectedness of the camp, whilst the two other observations show the influence which is exercised by neighbouring hills. In all three cases the observations show differences which are quite astonishing. The minimum temperature for every night, as given in the observations, was taken 5 ft. above ground.

Cloudage.—The *kind* of clouds is not given in the meteorological tables, as there is no space provided for such particulars, although same were duly registered in the Field Book, as well as the direction from which they were moving.

It may be mentioned here that it was observed that the *cirrus*, the genuine feathery kind, was generally found in the early morning and in the evening shortly before and after sunset, and that this upper-current cloudage almost invariably moved from north-west.

The *cirro-cumulus* was rarely observed, and never so moving, from a distinct direction, but whenever seen it could be taken as a sure indication of an increase of atmospherical moisture.

Cumulus clouds generally aggregated towards noon. The direction in which they moved was in the early portion of our journey (May-July) very variable, but during the latter part an easterly direction was prevalent.

From these general remarks however about cloudage, and its main direction of moving, the portion about, and south of, Queen Victoria Spring, and down to the Fraser Range, must be excepted, for this region being situated within the reach of coastal influences, the climate and conditions were consequently more of a maritime nature.

Some of the reasons for assuming that a distinct climatic boundary exists here have been given in a former chapter, and are purely of topographical nature.

It may be added here that a few days before reaching Queen Victoria Spring a strong cooling south-south-west breeze could be noticed springing up about 11 a.m. every day, which increased in strength as the coast was approached.

Should not also the existence of such a strong soakage, as Queen Victoria Spring has been at one time, be attributed to the meeting in this region of the dry and hot north-east winds of the interior with the moist southerly coastal winds, which, if it should take place, would be bound to create at times heavy atmospherical disturbances; and, furthermore, does not the occurrence of Xanthorrhea thereabout also point to increased atmospherical precipitates?

On Electric Discharges.—None were observed during the early part of the journey. It was at the end of September, between Victoria Spring and Fraser Range, when slight light-

ning, without thunder, was noticeable towards east. A few similarly slight discharges without atmospherical precipitates were observed during the next three months, but it was not until the beginning of January that the proper thunderstorm season set in, notwithstanding the intense dry heat which was experienced at this time.

Here a few words about the phenomenon of booming noises, about which a few remarks are given in the "Handbook for the Guidance of the Officers of the Expedition," viz. :— "Travellers and explorers in different parts of the world have occasionally been startled by loud booming sounds resembling the distant discharge of heavy pieces of artillery. Captain Sturt, in his explorations on the Darling in 1828, and again in 1844 in the Far North, between the Stony Desert and Eyre's Creek, reports having heard similar noises, but was unable to offer any suggestions as to their cause. In the event of such sounds being heard by yourself or by other members of the party, you will be careful to note the exact time on which heard, the supposed distance away and the direction, the state of the atmosphere (whether clear or cloudy), the nature of the surrounding country (whether sandy and flat or rocky and mountainous), and, by way of comparison, refer to similar well-known sounds. Enquiries on these points should also be made at all stations throughout Central Australia, and at all outlying sheep and cattle stations at which the expedition may happen to call, carefully noting every instance of these loud noises being heard, together with the name of your informant, his opinion as to the cause, and such other matter as would be recorded under the above instructions if heard by yourself. It is of the utmost importance to note whether such sounds are accompanied by any sensible vibrations of air or earth, and whether accompanied by any rumbling like thunder."

Though not fortunate enough to perceive it myself, by making enquiries I found that they were heard at the Fraser Range Station, at Yilgarn, and frequently during the last eight years at the Annean Station. No definite information was, however, obtained, as to the time, state of weather when they occurred, or such other details. Taking into consideration that these sounds were heard at three places which are geologically and topographically so vastly different, viz., *Fraser Range*, high and steep mountains of metamorphic rocks, *Yilgarn* slightly undulating country, salt lakes and plains of moderate extent, and *Annean Station*, wide, boundless, alluvial flats, and furthermore the same phenomenon has been heard in the Lake Eyre country and the Upper Murray, both regions of an entirely different geological character, certainly different to those places in Western

Australia, I feel convinced that this noise is not caused by any force of geological or terrestrial origin. But as these places from which the phenomenon in question is reported belong to the most arid regions of Australia, in which nothing but the meteorological conditions are alike, it must be assumed that these subaerial conditions are the cause. I should think that they are detonations resulting from electrical discharges in the form of a glow discharge, which while spreading over a large area is less perceptible, and is said to occur more frequently in a dry continental climate during a dry thunderstorm.

NOTES ON THE METEOROLOGICAL OBSERVATIONS TAKEN BY MR. VICTOR STREICH.

By C. Todd, Esq., M.A., F.R.S.

May, 1891.

The expedition travelled this month from Warrina Station on the Great Northern or Transcontinental Railway, lat. 28° 12′ S., long. 135° 48′ E. to Everard Range.

The observations were commenced on the 3rd, but, owing no doubt to the difficulties incidental to rough bush travelling, they are somewhat incomplete, and for the most part were taken *en route*, and not at camps. The aneroid was read at 9h. a.m. and 3h. p.m., at elevations varying from, approximately, 323 feet to 1800 feet above sea level. The dry and wet bulb thermometers were read regularly at 9h. a.m. and 3h. p.m., but not at 9h. p.m. Only a few readings of the minimum thermometer were taken, and but one of the maximum. These omissions render the observations of less value than those of subsequent months; but it is due to Mr. Streich to say that, taking his circumstances into consideration, he deserves great credit for the manner in which he carried out the work entrusted to him. It is not an easy task to take observations on a camel's back travelling over a rough country.

Referring to the observations in May, the temperature at 9h. a.m. ranged generally between 55° and 70°, only once rising above 70°, viz., 74° on the 6th, the maximum on that, the only day on which it was recorded being 86°, the hottest day experienced during the month, the thermometer standing at 80° at 3 p.m.; on only two days did it reach 80° at 3 p.m., viz., 80° on the 5th, and 81° on the 26th. The weather was therefore fairly cool and pleasant, with south-east, east, and north-east winds

only twice veering to north-west, and on two days to south-west. The air was mostly dry, but there was a thunderstorm on the 7th, 8th, followed by steady rain, about 0·250 inches falling before 3 p.m. of the 8th, and about 1·750 inches, continuous rain lasting from 4 p.m. of the 8th till 9h. a.m. of the 9th, with a high barometer (aneroid 30·20 at 9h. a.m., falling rapidly to 29·85 at 3 p.m. Rain also fell on the 27th, 28th, and 29th, setting in on the last date at 3 p.m., and raining heavily with storms during the night (1,600 feet above sea level; aneroid 28·50 at 9h. a.m. of the 30th, and 28·20 at 3 p.m.) A white frost on the morning of the 11th, the temperature falling to 32°.

Aneroid.

Mean at 9h. a.m.	...	29·45
" 3h. p.m.	...	29·32

Temperature.

		Dry Bulb.	Wet Bulb.
Mean at 9h. a.m.	...	61·0	55·0
" 3h. p.m.	...	73·0	58·0

JUNE.

During this month the observations were taken regularly, there being but few gaps. The aneroid and the thermometers were read at 9 a.m and 3 p.m., and the minimum and maximum temperatures were also taken. The expedition travelled from near Mount Illbillie (lat. 27° 3′, long. 132° 30′) to Camp 11 (lat. 27° 28′, long. 130° 38′), at elevations varying from 1,950 feet on the 1st to 1,700 feet on the 30th. The observations were taken in camp, near Mount Illbillie, on the 2nd, 3rd, 4th, 5th, and 6th, at 1,950 feet, and the height of the summit was hypsometrically determined to be 3,010 feet. During these five days the aneroid at the camp at base of hill ranged from 28·10 inches at 9h. a.m. of the 2nd to 28·40 at 3 p.m. on the 6th, the minimum and maximum temperatures being as under:—

	Min.	Max.
June 2	35°	67°
" 3	37	69
" 4	37	54
" 5	38	56
" 6	33	55

On the 3rd, at noon, the aneroid at the base of Illbillie was 28·10; the temperature, dry bulb 68°, wet bulb 50°; relative humidity, $\frac{31}{100}$. At 3h. p.m., at the top of the mount, the aneroid read 27·12; dry bulb (thermometer) 61°, wet bulb 51°; relative humidity, $\frac{50}{100}$.

Rain set in after 2 p.m. on the 1st, and showers continued

during the three following days, with the wind on the 1st and 2nd north-west, veering afterwards to south-east. A little rain fell also on the 12th, and there was a Scotch mist on the 13th.

The observations were also taken in Camp 4 (lat 27° 10′, long. 131° 48′) from the morning of the 10th till 9h. a.m. of the 18th. Elevation of the hypsometer 1,850 feet. The aneroid during this period ranged from 28·03 inches at 3h. p.m. of the 10th to 28·49 at 9h. a.m. on the 14th, and the minimum and maximum temperatures were as under :—

	Min.	Max.	
10th	32°	69°	Clear.
11th	35	66	Cloudy.
12th	30	69	Cloudy, little rain.
13th	29	60	Cloudy.
14th	29	66	Clear.
15th	26·5	63	Clear.
16th	29	69	Clear.
17th	28	67	Clear.
18th	40	70	Cloudy.

The only other rests were at Camp 6 (1,575 ft.), on 20th and 21st ; Camp 9 (1,540 ft.), from evening of 23rd to 9h. a.m. of the 27th ; and at Camp 10, on 28th and 29th.

With the exception of the first four days, and the 11th and 12th, the weather was fine ; the winds variable, south-east being the most frequent, and on some days, especially during the last five days, west (N.W. to S.W.).

The nights throughout were very cold, the temperature falling below freezing on 16 nights, the lowest being 22°, on the morning of the 23rd, with clear sky and light north-east wind, the mean, often minimum, reading was 30·5° or 1·5° below freezing. The highest minimum was 40° on the 18th. The days were pleasantly warm, the highest temperature (73°) curiously enough occurred on the same day as the lowest (22°), viz., on the 23rd, or a range of 51° during the day.

The sky was clear, or mostly clear, on 13 days, and partially clouded on 11 days. Faint zodiacal light on evening of 25th.

Aneroid.

Mean at 9h. a.m.	...	28·32
" 3h. p.m.	...	28·23

Temperature.

		Dry Bulb.	Wet Bulb.
Mean minimum	...	30·5°	
" at 9h. a.m.	...	52·6	46·7°
" maximum	...	64·2	
" at 3h. p.m.	...	61·3	49·1

Highest during month...	73	on 23rd
Lowest " " ...	22	on 23rd

Cloud (0—100).

Mean amount at 9h. a.m.	...	3·9 per cent.
" " at 3h. p.m.	...	4·2 "

JULY.

During this month the expedition was constantly on the move, from Camps 12 to 31 the country traversed lying between lat. 27° 33′, long. 130° 34′, and lat. 26° 10′, long. 127° 57′, at elevations above sea level ranging from 1,500 to 1,850 feet. The only long stoppages were four days (21st, 22nd, 23rd, and 24th) at Camp 27, 1,355 feet by hypsometer above sea level; and Camp 31, or Fort Müller, 1,517 feet by hypsometer, from July 28 to August 2—six days.

The chief features of the month were very cold nights, moderately warm days, and clear sky. The lowest temperature was 19°, on the morning of the 20th, at Camp 26 (lat. 27° 20′ 14″, long. 130° 4′), with a dry north-east wind, but the thermometer fell below freezing on 17 nights out of 29 on which observations were taken, and the minimum recorded 35° on only four nights. On the morning of the 1st, at Camp 12, 1,580 feet, it was 20°, and the mean of the lowest readings was only 30° 2′. As showing the rapid rise in temperature after sunrise in the interior, it may be mentioned that the mean at 9h. a.m. was 52° 9′, whilst the mean maximum was 68° 4′, or a mean daily range of 38° 2′. Owing to difficulties incidental to bush travelling, and where the observations have to be taken *en route*, the maximum readings were missed on five days; out of the remaining 26 days the temperature reached or receded 70° on 15 days, the highest being 77° on the 19th, the minimum on the morning of the same day being 24°, showing a range of 53° in less than 12 hours. The air was also very dry, as shown by the readings of the wet-bulb thermometer. The sky was clear, or nearly so, on 23 or 24 days. The weather was fin e throughout, except on the night of the 9th-10th, when a few showers fell. The winds were westerly during the first half of the month, and east and south-east afterwards, a strong easterly gale blowing on the nights of the 28th, 29th, and 30th. There was a warm southerly wind on the 31st, with a little rain and hail. A Mallet seismometer was fixed up at Camp 31, but indicated no earth tremors (*vide* Geological Report, *ante* p. 79).

Highest reading of aneroid, 28·72 inches, at 9h. a.m. on 18th, Camp 24. Lowest reading, 27·50 inches, at 3h. p.m. on the 9th, on the top of Mount Watson, 2,226 feet by hypsometer. Mean

reading of aneroid, 9h. a.m., 28·38 inches. Mean reading of aneroid, 3h. p.m., 28·29 inches.

Temperature.

Mean minimum	30·2°
" at 9h. a.m.	52·9
" maximum	68·4
" at 3h. p.m.	66·7

Wet Bulb.

Mean at 9h. a.m.	43·5
" at 3h. p.m.	47·5

AUGUST.

There was not much travelling this month, and the observations were all made in the immediate neighbourhood of the Barrow Range (Camps 31 to 37), or between long. 127° 57′ and 127° 15′, and lat. 26° 11′ and 26° 30′; principally (on the 4th, and from the 9th to the 22nd) at Camp 33, long. 127° 33′ E., lat. 26° 3′ S., 1,566 feet above sea level, and Camp 35, at the base of Mount Squires—127° 30′ E., 26° 14′, 1,590 feet. The month was almost cloudless throughout, the prevailing wind being east to south-east, occasionally veering to north and north-west. Heavy north-western gale was recorded on the 13th, veering to south-west. The nights during the first three weeks were very cold, the thermometer sinking below freezing point on 14 nights out of the 21, but warmer during the rest of the month. On two nights—the 15th and 19th—the minimum was 20°. The warmest night was on the 30th; minimum, 48°. The days, as usual, were warm, the thermometer being at or above 80° on seven days, and above 70° on 27 days; the highest being 85° on the 22nd and 31st, or a range of 65° in the month; the lowest maximum being 65° on the 18th. The aneroid barometer reached its minimum, 28·10 inches, at 3 p.m. on the 11th, at Camp 33; and its maximum, 28·61 inches, at 9 a.m. on the 20th.

Aneroid.

Mean at 9 a.m.	28·42	inches
" at 3 p.m.	28·33	"
" at 9 p.m.	28·37	"
Mean minimum temperature ...	33·5°	
" at 9 a.m. Dry bulb ...	57·7	
Wet bulb ...	45·5	
" maximum temperature ...	75·7	
" at 3 p.m. Dry bulb ...	72·2	
Wet bulb ...	51·1	

Mean at 9 p.m.	Dry bulb ...	54·3°
	Wet bulb ...	42·1
"	temperature of month ...	54·6
"	diurnal range	42·2

Cloud (0—100).

Mean amount at 9 a.m.	... ...	1 per cent.
" "	at 3 p.m.	2 "
" "	at 9 p.m.	0 "

Heavy north-west gale from noon to sunset on the 13th.

Heavy south-east gale set in at 4h. a.m. on 26th, and sky overcast.

The sky was also overcast for a few hours before sunrise on the 31st, with strong north-east wind.

Zodiacal light, bright, on 5th, between 6.30 and 7.20 p.m.; and on evening of 25th. Shooting stars frequent on evenings of 5th, 6th, and 7th; and two fine meteors on the evening of the 8th.

September.

Country travelled over from Barrow Range to Fraser Range at elevations varying from 1,600 to 700 feet above the sea. The days, with four exceptions, were warm, the temperature being 90° or over on five days, and over 80° on 11 days, absolute maximum 98° on the 27th. The nights were cool, falling to or below freezing on six nights, the lowest being 26°, on the morning of the 20th, when there was a white frost. The weather was exceptionally cool on the 16th, 17th, 18th, and 19th. With a heavy gale from the west and south-west on the first day, the maximum temperatures, 55° on 16th, 58° on 18th, and 61° on 19th, and the air was so humid that the wet bulb thermometer at 3 p.m. read (50°) only one degree lower than the dry bulb. Wind south-east to north-east. Light rain between 5 a.m. and 8 a.m. on 13th, and a few drops on nights of 18th and 19th. Sky mostly clear, but overcast or partially clouded on 11th, 12th, 13th, 16th, and 17th.

Lightning noted on the 12th and 25th, and fog on the 13th. Zodiacal light seen on evenings of 3rd and 23rd. The observations imperfect after 25th through difficulties in travelling.

Pressure.

Mean reading of aneroid at	9h. a.m. ...	28·82
" "	3h. p.m. ...	28·94
" "	9h. p.m. ...	28·81

Temperature.

Mean of minimum	38·4°
" at 9h. a.m.	61·1

Mean maximum	78·2°
" at 3h. p.m.	73·8
" at 9h. p..m.	55·8
" diurnal range	39·8
Extreme range in month	72·0

Wet Bulb.

Mean at 9h. a.m.	49·7°
" at 3h. p.m.	53·9
" at 9h. p.m.	46·0

Cloud (0—100).

Mean amount at 9h. a.m.	...	23 per cent.
" " 3h. p.m.	...	32 "
" " 9h. p.m.	...	9 "

OCTOBER.

No observatlons were taken during the first four days, owing to difficulties in travelling. From the 5th to the end of the month, with a break on the 20th, 21st, and 22nd, they were taken at Camp 69, Fraser's Range (lat. 31° 51′ S., long. 122° 45′ E.), 1,236 feet above sea level. The nights were now warmer than during the previous months, the temperature falling below 40° on only one night, viz., 37° on the 10th, and the minimum readings ranged at or over 50° on 12 nights out of 26. The days were moderately hot, the maximum readings from 68° on the 9th to 98° on the 19th, or over 90° on three days. The sky was clouded or overcast nearly every day, with light to moderate variable winds, alternating for the most part from south-east to south-west. Thunderstorms were experienced on six days, viz., 6th, 19th, 23rd, 24th, 27th, and 28th, but were accompanied by only a few drops of rain, except on the 28th, when there was a good shower, with hail.

Mean reading of aneroid at 9h. a.m.	...	28·80 inches
" " 12h. noon	...	28·78 "
" " 3h. p.m.	...	28·70 "
" " 6h. p.m.	...	28·76 "
" " 9h. p.m.	...	28·79 "

Temperature.

	Dry Bulb.
Mean minimum	49·5°
" at 9h. a.m.	65·1
" at 12h. noon	76·3
" maximum	79·7
" at 3h. p.m.	76·5
" at 6h. p.m.	68·4
" at 9h. p.m.	62·2

Cloud (0– 100).

Mean amount at		9h. a.m.	...	3·9 per cent.
"	"	noon	...	3·5 "
"	"	3h. p.m.	...	4·1 "
"	"	6h. p.m.	...	2·5 "
"	"	9h. p.m.	...	1·9 "

Dew on 8th, 17th, 15th, 29th, and 30th.

NOVEMBER.

The expedition travelled from Fraser Range to the Yilgarn Goldfields, and the observations were taken, *en route*, at heights varying from 1,500 to 900 feet above the sea. No observations could be recorded on the 20th, 21st, and 22nd, owing to the absence of Mr. Streich from the Camp, and also on the 30th.

The nights were moderately cool, and the days hot, the minimum thermometer ranging between 41°, the lowest on the 4th, and 65°, and over 60°, on eight nights. During the day the temperature reached or receded 90 on 17 days out of the 26 on which readings were taken, and was above 100° on four days, the absolute maximum being 105° on the 23rd. The weather was fine and dry, only a few drops of rain falling during two thunderstorms on the 6th and 14th. The wind was light and variable, south-east the most prevalent.

Mean reading of aneroid at		9h. a.m.	...	28·62 inches.
"	"	3h. p.m.	...	28·50 "
"	"	9h. p.m.	...	28·54 "

Temperature.

Mean minimum		... ...	...	56·1°
"	"	at 9h. a.m.	...	74·9
"	maximum	... ...	...	92·8
"	"	at 3h. p.m.	...	90·6
"	"	at 9h. p.m.	...	70·1

Cloud (0—100).

Mean amount at		9h. a.m.	...	20 per cent.
"	"	3h. p.m.	...	32 "
"	"	9h. p.m.	...	18 "

DECEMBER.

Country passed over between Yilgarn and the Murchison District at elevation of from 1,600 to 1,000 feet above the sea. Weather hot throughout, the thermometer ranging from 90° upwards on 25 days, and over 100° on 16 days, the absolute maximum being 109° on the 27th and 28th. The nights too were for the most part warm, falling below 60° on only ten nights; the lowest, 52°, on the 10th; the highest minimum, 75°, on the

27th. The extreme range of temperature was 57°, whilst the average daily range was 36° 1′. Winds variable, frequently south-west and north-west. Weather fine, but on many days clouded. Thunderstorms, with only a few drops of rain, on the 5th and 6th; and lightning also on the 8th, 25th, and 26th. A westerly gale, with rain, on the night of the 10th; and rain, with south-easterly wind, on the 16th.

Fine solar halo on the 29th.

Mean reading of aneroid at 9h. a.m.	28·42	inches
" " at 3h. p.m.	28·33	"
" " at 9h. p.m.	28·37	"

Temperature.

Mean minimum	62·8°
" at 9h. a.m.	8·38
" maximum	98·9
" at 3h. p.m.	96·3
" at 9h. p.m.	78·8
" of wet bulb at 9h. a.m. ...	62·6
" " at 3h. p.m. ...	64·7
" " at 9h. p.m. ...	60·2

Cloud (0—100).

Mean amount at 9h. a.m. ...	15	per cent.
" " at 3h. p.m. ...	23	"
" " at 9h. p.m. ...	15	"

Clear or cloudless on 13 days.

January, 1892.

The observations after the 3rd were all taken at the Annean Station, in the Murchison District, about 1,550 feet above the sea, and extend only to the 21st, after which date they were discontinued. Weather hot throughout, the temperature exceeding 90° on every day but the 11th (88·8°) and over 100° on 18 days, and of the 21 the highest being 114°. The minimum readings range from 65° on the 1st to 82° on the 10th. The extreme range during the three weeks 49°, and the mean daily range 29·8°

Thunderstorms on the 2nd, 3rd, 6th, 10th, 13th, 14th, 15th, and 16th; and lightning seen on several other days, but very little rain fell, only 0·470 inches, as follows:—

1st	...	9h. a.m.	0·190	inches
2nd	...	9h. a.m.	0·110	"
6th	...	9h. p.m.	0·110	"
16th	...	9h. p.m.	0·060	"

Generally more or less cloudy, especially in the afternoon and night.

Mean reading of aneroid at 9h. a.m.	...	28·18 inches
" " 3h. p.m.	...	28·08 "
" " 9h. p.m.	...	28·12 "

Temperature.

Mean minimum ...	...	74·3
" at 9h. a.m....	...	89·6
" maximum ...	...	104·1
" at 3h. p.m....	...	101·1
" at 9h. p.m....	...	88·1
" temperature	...	89·2

Wet Bulb.

Mean at 9h. a.m....	...	66·8
" at 3h. p.m....	...	69·1
" at 9h. p.m....	..	67·6

Cloud (0—100).

Mean amount at 9h. a.m.	...	29 per cent.
" " at 3h. p.m.	...	51 "
" " at 9h. p.m.	...	50 "

METEOROLOGICAL OBSERVATIONS TAKEN BY MR. VICTOR STREICH, GEOLOGIST ACCOMPANYING THE ELDER EXPLORING EXPEDITION. 1891—MAY.

Day of Month.	Camp. Morning. No.	Camp. Morning. Height.	Camp. Evening. No.	Camp. Evening. Height.	Aneroid Barometer. 9 a.m.	Aneroid Barometer. 9 p.m.	Temperature. Dry Bulb. Min.	Dry Bulb. 9 a.	Dry Bulb. Max.	Dry Bulb. 3 p.	Dry Bulb. 9 p.	Wet Bulb. 9 a.	Wet Bulb. 3 p.	Wet Bulb. 9 p.	General Direction of Wind.
1															
2															
3	Nilpena, S.A.		Cootanoorina, S.A.		29·99			58		77		53	54		E.
4	Cootanoorina, S.A.		"		·95		36	64		79		56	60		E.
5	"		"		·94		40	66		80		57	60		E.
6	"		"		·94		44	74	86	84		63	65		E.
7	"		Arkaringa Ck.		·94		53	65		73		58			S. & S.E.
8	Arkaringa Ck.		"		·97			58		66		45	60		E.S.E.
9	"		"		30·20			52		55		51	54		N.E.
10	"		"					55				49			E.
11	"		"		·10		32	50		62		48	54		E.
12	En route		En route		·20			54		68		49	52		E. & N.E.
13	"		"		29·98			55		75		51	55		E.
14	"		"		·96			56		74		49			S.E. & E.
15	"		"		·83			55		75		51	55		N.E.
16	"		In camp		·48			59		72		50	56		N.W.
17	In camp		"		·36			61		74		57	58		S.W.
18	En route		En route		·61			61		70			56		S.E.
19	"		Wintana Well	1100	·36			59		70		53	54		E.
20	Wintana Well	1100	En route		·23			61		74		53	57		E. & N.
21	En route		"		·15					75			56		E.
22	"		"		·08			64		75		58	58		E. & S.E.
23	Arcoellina Well		Arcoellina Well		28·96		51	67		76		66	60		N.E.
24	"	1250	"	1250	·98		55	68		79		60	59		N.E.
25	"		"		·98		48	64		79		58	61		N.E.
26	"		"		·94		42	69		81		59	60		N.E.
27	"		"		·94		56	67		78		59	51		N. & N.E.
28	"		"		·86			61		65		58	61		S.W.
29	"		En route		·72			60		64		56	61		N.E.
30	En route	1600	"												
31		1800													

Day of Month.	Camp.				Aneroid Barometer.		Temperature.								General Direction of Wind.
	Morning.		Evening.				Dry Bulb.					Wet Bulb.			
	No.	Height.	No.	Height.	9 a.m.	9 p.m.	Min.	9 a.	Max.	3 p.	9 p.	9 a.	3 p.	9 p.	
1	En route		En route		28·39			55		50		54	50		N.W.
2	Everard Range Depôt Camp	1950	Everard Range Depôt Camp	1950	·10		35	56	67			55			N.W.
3	"	"	"	"	·11		37	58	69	61		50	51		E.
4	"	"	"	"	·22		37	51	54	54		51	51		S.E.
5	"	"	"	"	·28		38	48	56	53		47	49		S.E.
6	"	"			·36		33	50	55	51		44	45		S.E.
7	"	"	Camp 1	1980	·59			48	59	57		42	48		S.E.
8	Camp 1	1980	Camp 2	1900	·33		27	51	68	65		46	51		S.W.
9	Camp 2	1900	Camp 3	1800	·26		33	56	66			50			S.E
10	Camp 3	1800	Camp 4	1875	·10		32	55	69	68		50	50		N. & S.W.
11	Camp 4	1555	"	"	·19		35	49	66	66		46	50		S.W.
12	"	"	"	"	·34		30	54	69	65		50	54		W.
13	"	"	"	"	·44		29	57	60	57		55	48		S.W.
14	"	"	"	"	·49		29	54	66	63		47	50		S.E.
15	"	"	"	"	·41		26·5	51	63	61		45	49		S.E.
16	"	"	"	"	·37		29	60	69	67		50	49		N.E. & S.W.
17	"	"	"	"	·43		28	52	67	63		44	49		E. & S.W.
18	"	"	Camp 5		·47		40	47	70	64		44	47		S·E.
19	Camp 5	1580	Camp 6	1575	·48		35	48	60	58		42	46		E. & S.E.
20	Camp 6	1575	"	"	·42		30	46	57	55		41	45		S.E.
21	"	"	"	"	·41		27	48	57	55		43	45		E.
22	"	"	Camp 7	1550	·29		24	48	63	61		40	47		E.
23	Camp 7	1550	Camp 8		·40		22	44	73	69		39	49		N.E.
24	Camp 8		Camp 9	1540	·53		24	51	70	66		44	49		S.W.
25	Camp 9	1540	"	"	·41		30	59	72	70		49	51		E. & N.W.
26	"	"	"	"	·25		34	59	69	69		49	58		N.W. & W.
27	"	"	Camp 10		·17		36	58	62	61		47	49		W.
28	Camp 10		"	"	·06		40	59	63	62		48	49		W.
29	"	"	Camp 11		·05			50		64		44	51		W.
30	Camp 11		Camp 12	1580	·31		26	55	68			46			W.

Day of Month.	Camp. Morning. No.	Camp. Morning. Height.	Camp. Evening. No.	Camp. Evening. Height.	Aneroid Barometer. 9 a.m.	Aneroid Barometer. 9 p.m.	Temperature. Dry Bulb. Min.	Dry Bulb. 9 a.	Dry Bulb. Max.	Dry Bulb. 3 p.	Dry Bulb. 9 p.	Wet Bulb. 9 a.	Wet Bulb. 3 p.	Wet Bulb. 9 p.	General Direction of Wind.
1	Camp 12	1580	Camp 13	1590	28·31		20	55				46			W.
2	Camp 13	1590	Camp 14	1730	·24		35	56	72	68		45	48		W.
3	Camp 14	1730	"	"											
4	"	"	Camp 15	1700	·18			64		78		46	54		W.N.W. & W.
5	Camp 15	1750	"	"	·21		42	62	75	71		51	54		W. & N.W.
6	"	"	"	"	·30		34	52	72	68		48	53		W.
7	"	"	Camp 16		·25		29·5	55	72	72		45	51		N.W.
8	Camp 16		Camp 17	1500	·32		27	48	70	69		44	51		W. & S.W.
9	Camp 17	1500	"	"	·37		34	46	57	56		42	45		W. & W.S.W.
10	"	"	Camp 18		·33		38	49	60	59		45	44		W.
11	Camp 18		Camp 19	1850	·26		40	54		61		46	52		Calm
12	Camp 19	1850	"	"	·19		29	54	71	70					W.
13	"		Camp 20	1835	·20		28	49							W.
14	Camp 20	1835	Camp 21		·15		29	49	69	65		44	47		W.
15	Camp 21		Camp 22	1750	·17		25	52	70	63		45	48		S.E.
16	Camp 22	1750	Camp 23		·26		32	51	68	62		42	48		S.E.
17	Camp 23		Camp 24		·65		26	50	71	65		42	46		E.
18	Camp 24		Camp 25		·71		33	54	67	67		42	47		E.
19	Camp 25		Camp 26		·72		24	50	77	68	41	40	47	31	E.
20	Camp 26		Camp 27	1355	·63		19	57	73	67	39	44	46	36	N.E.
21	Camp 27	1355	"	"	·44		29	57	70	68	45	42	47	32	E.S.E.
22	"	"	"	"	·45		26	55	71	71	46	42	47	36	S.E.
23	"	"	"	"	·54		25	51	68	65	47	42	47	36	E.
24	"	"	"	"	·57		24	52	70	67	48	45	47	41	N.E., E., S.
25	"	"	Camp 28	1475	·62		27	51	68	66	44	42	48	38	E.
26	Camp 28	1475	Camp 29	1400	·32		28	53	64	63	48	41	43	40	E. & S.E.
27	Camp 29	1400	Camp 30		·36			49	65	65	45	40	42	37	E.
28	Camp 30		Camp 31 (Fort Müller)	1517	·45		34	47	66	64	50	40	46	39	E. & S.E.
29	Camp 31	1517	"	"	·46		35	55	70	64	50	44	46	38	E.
30	"	"	"	"	·46		34	58	70	66	51	44	46	41	E.
31	"	"	"	"	·37		40	52	60	57	47	40	44	38	S.W., S., S.E.

Day of Month.	Camp. Morning. No.	Camp. Morning. Height.	Camp. Evening. No.	Camp. Evening. Height.	Aneroid Barometer. 9 a.m.	Aneroid Barometer. 9 p.m.	Temperature. Dry Bulb. Min.	9 a.	Max.	3 p.	9 p.	Temperature. Wet Bulb. 9 a.	3 p.	9 p.	General Direction of Wind.
1	Camp 31 (Fort Müller)	1517	Camp 31	1517	28·44	28·42	24	52	67	64	47	42	47	39	S.E.
2	"	"	Camp 32	"	·42	·43	32	47	78	70	50	43	50	40	E. & S.E.
3	Camp 32		Camp 33	1565	·32	·31	23	57	79	73	55	47	48	43	E. & S.E.
4	Camp 33	1565	"	"	·37	·35	25	54		71	58	46	50	38	E. & S.E
5	"	"	"	"	·35	·36	42		79		60			46	E.
6	"	"	"	"	·35	·34	24	60	72	71	59	45	51	39	S.E.
7	"	"	"	"	·34	·32	25	64	77	73	42	44	50	38	E.
8	"	"	"	"	·39	·35	29	59	73	70	57	46	50	43	E.
9	"	"	"	"	·41	·36	33	55	70	68	52	48	49	49	E. & S.E.
10	"	"	"	"	·33	·20	35	57	79	70	48	47	50	43	E.
11	"	"	"	"	·17	·16	35	64	79	75	54	48	53	42	N.E.
12	"	"	"	"	·24	·23	38	62	82	80	58	48	58	44	N.N.W.
13	"	"	"	"	·23	·19	39	68	82	80	62	50	57	48	N.E & N.W.
14	"	"	"	"	·37	·36	40	55	70	64	53	45	48	43	S.E. & E.
15	"	"	"	"	·41	·30	20	55	72	68	48	43	51	38	N.E.
16	"	"	"	"	·34	·31	28	63	80	79	64	41	51	44	S.W.
17	"	"	"	"	·50	·49	39	49	66	65	50	43	49	39	E. & S.E.
18	"	"	"	"	·54	·50	30	48	65	64	52	42	49	41	E. & S.E.
19	"	"	"	"	·58	·53	20	50	72	70	52	39	51	40	E.
20	"	"	"	"	·61	·53	28	58	74	72	54	46	51	40	E.
21	"	"	"	"	·58	·49	28	63	78	73	48	47	51	38	E.
22	"	"	Camp 34		·44	·29	35	67	85	82	64	48	54	44	N.N.E.
23	Camp 34		Camp 35	1590	·43	·43	36	58	79	72	58	48	53	44	E. & S.E.
24	Camp 35	1590	"	"	·51	·46	37	53	84	81	58	45	54	43	E. & S.E.
25	"	"	"	"	·34	·22	40	52	78	76	66	45	54	48	N.E. through E. to S.W.
26	"	"	"	"	·48	·42	41	50	66	65	49	46	49	40	S.E.
27	"	"	"	"	·53	·46	34	58	71	69	57	44	51	44	E.
28	"	"	"	"	·59	·51	44	62	73	70	51	46	52	42	N.W.
29	"	"	"	"	·58	·40	47	61	76	74	53	48	54	44	N.N.E.
30	"	"	Camp 36		·41	·40	48	61	81	76	49	44	52	39	N.
31	En route		Camp 37		·42	·50	39	70	85	82	55	50	55	42	N.E. & W.

Day of Month.	Camp. Morning. No.	Camp. Morning. Height.	Camp. Evening. No.	Camp. Evening. Height.	Aneroid Barometer. 9 p.m.	Aneroid Barometer. 9 a.m.	Temperature. Dry Bulb. Min.	Dry Bulb. 9 a.	Dry Bulb. Max.	Dry Bulb. 3 p.	Dry Bulb. 9 p.	Wet Bulb. 9 a.	Wet Bulb. 3 p.	Wet Bulb. 9 p.	General Direction of Wind.
1	En route		Camp 38		28·58	28·58	39	76	90	88	54	52	59	39	Calm
2	"	1600	Camp 39	1100	·51	·22	32	68	89	87	58	48	56	42	N.W.
3	"	1550	Camp 40		·31	·45	46	60	82	80	52	50	55	46	S.W.
4	"		Camp 41		·37	·66	30	56	68	65	51	44	50	44	N.E.
5	"	1680	Camp 42		·75	·64	28	51	68	68	50	44	56	46	E.
6	"		Camp 43		·55	·39	29	57	73	71	54	48	54	43	E.
7	"	1500	Camp 44		·37	·16	47	59	89	85	73	47	59	55	E. & N.E.
8	"		Camp 45		·40	·37	50	68	78	77	54	54	56	48	S.W.
9	"		Camp 46	1300	·49	·59	36	57	78	72	55	51	57	49	SE., SSW., & S.
10	"		Camp 47	1100	·75	·79	40	58	78	75	52	49	51	43	E.
11	"	1150	Camp 48		·75	·69	50	65	70	70	48	51			S.E. & S.W.
12	"		Camp 49	980	·77	·99		57	78	74	60	48	56	45	S.W., W., & S.E.
13	"		Camp 50		29·18	29·09	44	55	66	66	54	52	53	45	S.E. & S.W.
14	"		Camp 51		·13	·02	32	55	79	78	53	46	53	45	S.W.
15	"		Camp 52	850	28·99	·19	35	62	79	76	60	54	55	49	W. & N.W.
16	"		Camp 53		·63	28·89	36	55	55	51	49	49	50	43	S.W. & W.
17	"		Camp 54	1100	29·00	·96		59		66		49	52		N.E.
18	"		Camp 55		28·95	29·02	38	53	58	57	54	44	44	43	E. & S.E.
19	"		Camp 56		29·23	·24	35	52	61	58	49	47	49	43	S.E.
20	"		Camp 57		·32	·32	26	56	76	75	55	47	50	49	S.E.
21	"		Camp 58	750	·32	·20	34	55	76	75	49	50	53	46	E.
22	"		Camp 59		·21	·20	36	60	82	79	50	53	54	46	N.E.
23	"	1050	Camp 60 (Queen Victoria Spring)	836	28·95	·00	37	70	83	80	69	55	55	52	E.
24	Camp 60		Camp 60	836	29·20	28·97	41	75	90	87	67	55	57	48	N. & N.E.
25	En route		Camp 61		28·77	·60	41	74	92	90	68	54	60	55	N.E.
26	"		Camp 62	1160					95						
27	"		Camp 63	1000	28·73			65	98			52			
28	"		Camp 64	1450			60		80						
29	"		Camp 65	1100						69					
30	"		Camp 66	1000	28·90										

Day of Month.	Camp.				Aneroid Barometer.		Temperature.								General Direction of Wind.
	Morning.		Evening.				Dry Bulb.					Wet Bulb.			
	No.	Height.	No.	Height.	9 a.m.	9 p.m.	Min.	9 a.	Max.	3 p.	9 p.	9 a.	3 p.	9 p.	
1	En route		Camp 67												
2	"		Camp 68	1250											
3	Camp 68	1250	"	"											
4	"	"	Camp 69 (Fraser Range)	1236											
5	Camp 69	1236	"	"	28·59	28·42	59	72	83	75	61				S.E. & S
6	"	"	"	"	·47	·46	40	66	80	77	59				S.W. & W.
7	"	"	"	"	·74	·75	51	66	73	69	66				S.W.
8	"	"	"	"	·73	·66	44	65	78	77	59				W.
9	"	"	"	"	·77	·78	49	50	68	68	58				W. & S.W.
10	"	"	"	"	·83	·81	37	57	78	76	55				
11	"	"	"	"	·87	·90	49	60	75	73	59				S.E.
12	"	"	"	"	·94	·90	53	58	74	69	62				S.E.
13	"	"	"	"	·91	·85	42	64	73	71	59				S.E.
14	"	"	"	"	·84	·74	40	60	77	73	61				S.E. & S.
15	"	"	"	"	·75	·78	58	68	77	73	55				W. & S.W.
16	"	"	"	"	·84	·86	51	57	78	76	65				W., S.W., & S.
17	"	"	"	"	·92	·86	45	55	78	78	59				
18	"	"	"	"	·85	·76	40	69	92	88	65				N.E.
19	"	"	"	"	·76	·76	55	85	98	96	79				N.E., E., & S.E.
20	"	"	"	"											
21	"	"	"	"											
22	"	"	"	"											
23	"	"	"	"	28·70	28·62	55	62	86	79	68				E. & S.E.
24	"	"	"	"	·64	·58	59	79	93	85	72				W. & N.W.
25	"	"	"	"	·79	·89	55	79	85	85	64				N.W. & S.E.
26	"	"	"	"	·95	·86	52	75	86	86	68				N.E. & S.
27	"	"	"	"	·86	·76	50	65	80	80	63				S.E. & N.W.
28	"	"	"	"	·77	·81		60	72	62	53				W., S., & S.E.
29	"	"	"	"	·87	·80	49	58	69	65	60				S.W. & S.
30	"	"	"	"	·82	.82	47	68	82	75	63				W. & S.W.
31	"	"	"	"	·94	·88	59	65	80	79	60				S.W. & S.

Day of Month.	Camp. Morning. No.	Height.	Evening. No.	Height.	Aneroid Barometer. 9 a.m.	9 p.m.	Temperature. Dry Bulb. Min.	9 a.	Max.	3 p.	9 p.	Wet Bulb. 9 a.	3 p.	9 p.	General Direction of Wind.
1	Camp 69	1236	Camp 69	1236	28·89	28·71	59	70	86	83	65				S.E. & S.
2	"	"	Camp 70	850	·73	·80	61	75	95	95	64				N., N.W., & W.
3	En route	1300	Camp 71	1200	29·05	·92	53	72	82	80	64				S.E. & S.W.
4	"	900	Camp 72		28·92	·90	41	70	89	85	96				E.
5	"		Camp 73	1500	29·06	·50	55	65	93	91	70				E.
6	"		Camp 74	1100	28·58	·60	60	83	99	97	70				N.W. & S.W.
7	"	1050	Camp 75	1200	·81	·65	53	74	90	89	77				E. & S.E.
8	"		Camp 76 (Hunt's Well)	1250	·59	·62	63	75	90	90	72				
9	Camp 76	1250	"	"	·65	·63	60	77	102	100	70				E.
10	En route		Camp 77		·57	·43	65	80	101	97	81				
11	"	1500	Camp 78	1200	·46	·51	59	81	98	93	79				E. & S.E.
12	"		Camp 79		·62	·50	61	81	99	93	70				E.
13	"		Camp 80	1600	·44	·21	59	73	96	96	68				E. & N.E.
14	"		Camp 81	1650	·13	·23	56	87	98	96	67				N.W., W., S.E.
15	"		Camp 82		·41	·13	56	65	86	86	63				S.E. & S.
16	"		Camp 83	1750	·23	27·95	48	67	89	87	68				S.E. & E.
17			Camp 84	1600	·21	28·37	66	85	91	89	79				NE. WNW., SW.
18	Camp 84	1600	"	"	·44	·51	50	70	90	90	69				S.E.
19	En route	1100	Camp 85	1150	·81	·68	56	72	86	81	69				S.E. & E.
20	"		Camp 86 (Southern Cross)	950											
21	Camp 86	950	"	"											
22	"	"	"	"											
23	En route		Camp 87		28·50	28·25		75	105	105	73				N.
24	"		Camp 88	1125	·27	·36	62	82	103	100	75				N.W. & S.W.
25	Camp 88	1125	"	"	·51	·58	59	77	89	88	68				S.E., S.W., W.
26	"	"	Camp 89	930	·87	·83	49	66	84	82	62				E. & S.E.
27	Camp 89	930	"	"	·87	·76	42	63	86	86	69				N.E. & E.
28	"	"	"	"	·81	·77	56	81	90	88	72				E.
29	"	"	"	"	·82	·71	59	82	96	88	69				E.N.E. & N.E.
30	"	"	"	"											

Day of Month.	Camp. Morning. No.	Camp. Morning. Height.	Camp. Evening. No.	Camp. Evening. Height.	Aneroid Barometer. 9 a.m.	Aneroid Barometer. 9 p.m.	Temperature. Dry Bulb. Min.	Dry Bulb. 9 a.	Dry Bulb. Max.	Dry Bulb. 3 p.	Dry Bulb. 9 p.	Wet Bulb. 9 a.	Wet Bulb. 3 p.	Wet Bulb. 9 p.	General Direction Wind.
1	Camp 89	930	Camp 89	930											
2	"	"	"	"		28·49			105	101	83		70	62	
3	"	"	"	"	28·42	·49	63	91	100	97	78	69	64	62	WNW,NW,SW
4	"	"	"	"	·62	·53	59	72	90	90	76	60	67	59	E. & S.E.
5	"	"	"	"	·61	·51	60	70	90	89	77	59	70	63	E.
6	"	"	"	"	·56	·49	59	72	89	88	75	63	69	62	E.
7	Camp 89	"	Camp 90		·43	·34	62	89	102	90	63	68	63	58	S.E., N.W.
8	En route		Camp 91	1200	·61		58	70				58			N.E.
9	"		Camp 92	1500	·37	28·09	54	69	97	91	74	54	58	55	
10	"		Camp 93	1600	·17	·28	52	72	89	81	68	59	66	55	S.W. & W.
11	"		Camp 94	1850	·35	·19	53	66	93	88	66	51	57	57	S.W., W. & W.
12	"		Camp 95	1700	·22	·09	54	78	94	90	68	57	60	54	S.W.
13	"		Camp 96	1600	·29	·23	53	74	87	84	73	58	61	58	S.W. & W.
14	"		Camp 97	1500	·30	·17	56	80	95	92	71	61	61	51	W. & N.W.
15	"		Camp 98	1400	·33	·49	59	86	101	99	79	61	62	58	W.
16	"		Camp 99	1100	·62	·48	65	76	80	60	69	60	65	66	E. & S.E.
17	"		Camp 100	1000	·37	·57	66	86	98	96	78	64	65	63	W.
18	Camp 100	1000	"	"	·63	·61	67	96	104	104	81	66	65	61	S. & S.W.
19	En route		Camp 101	1150	·48	·41	69	94	106	105	88	85	69	63	E.
20	"		Camp 102	1500	·27	·18	69	93	105	104	84	64	66	64	N.W. & W.
21	"		Camp 103	1600	·27	·32	59	82	98	98	79	63	64	62	W. & S.W.
22	"		Camp 104	1200	·43	·55	64	86	93	91	78	59	63	60	S.E. & S.W.
23	"		Camp 105	1400	·63	·58	60	84	100	97	76	61	63	56	E.
24	"		Camp 106	1000	·59	·53	67	90	103	101	88	63	65	60	N.E., N., & S.E.
25	Camp 106	1000	"	"	·54	·45	68	95	108	107	95	62	67	64	E.
26	"	"	"	"	·48	·41	72	97	107	106	91	69	72	65	N.W. & W.
27	En route		Camp 107	950	·43	·30	75	96	109	108	85	69	66	62	W. & S.W.
28	"		Camp 108		·22	·33	69	89	109	108	83	61	64	59	
29	Camp 108		"	"	·38	·32	68	98	106	102	88	60	59	59	E. & S.W.
30	En route		Camp 109	1100	33	·28	69	89	105	101	86	65	68	66	
31	"		Camp 110	1400	·32	·08	72	90	106	106	84	66	68	63	N.E. & E.

Day of Month.	Camp. Morning. No.	Camp. Morning. Height.	Camp. Evening. No.	Camp. Evening. Height.	Aneroid Barometer. 9 p.m.	Aneroid Barometer. 9 p.m.	Temperature. Dry Bulb. Min.	Dry Bulb. 9 a.	Dry Bulb. Max.	Dry Bulb. 3 p.	Dry Bulb. 9 p.	Wet Bulb. 9 a.	Wet Bulb. 3 p.	Wet Bulb. 9 p.	General Direction of Wind.
1	En route		Camp 111	1600	28·14	28·07	65	89	105	102	87	64	69	69	E. & S.
2	"		Camp 112		·10	27·88	69	90	106	106	87	67	70	75	N.E., N., S.W.
3	"		Camp 113 (Annean Station)	1550	·18	28·10	75	82	100	95	90	72	72	74	N.E, N.W, S.W.
4	Camp 113	1550	"	"	·22	·23	69	90	101	100	80	75	76	70	W.
5	"	"	"	"	·27	·17	71	85	100	99	86	67	68	72	N.E.
6	"	"	"	"	·19	·10	78	97	104	102	86	70	72	70	N.E. & S.
7	"	"	"	"	·20	·16	78	93	105	103	92	69	71	64	NNW, NNE, S
8	"	"	"	"	·18	·10	81	95	110	109	96	68	72	66	N.E.
9	"	"	"	"	·10	·07	80	102	114	112	95	73	72	72	N. & S.
10	"	"	"	"	·23	·24	82	88	99	96	90	68	69	68	N.E.
11	"	"	"	"	·35	·31	75	78	88	84	82	64	65	65	N.E.
12	"	"	"	"	·30	·20	71	84	101	100	87	63	71	68	N.E.
13	"	"	"	"	·20	·10	72	92	108	107	92	64	65	68	N.E., N., N.W.
14	"	"	"	"	·13	·06	74	96	107	104	95	64	69	64	N.E., S.E.
15	"	"	"	"	·18	·12	79	95		107	92	62	68	68	N.
16	"	"	"	"	·18	·14	80	92	108	102	90	66	70	67	N.E., N.W.
17	"	"	"	"	·12	·06	77	92	108	104	89	67	68	64	N.E., S.W.
18	"	"	"	"	·14	·12	69	86	99	97	82	65	66	63	S.
19	"	"	"	"	·16	·12	78	92	108	102	88	68	70	66	E. & N.E.
20	"	"	"	"	·14	·10	68	84	97	93	82	62	62	64	S., E.
21	"	"	"	"	·13	·08	70	79	100	99	83	64	66	63	N.E.
22	"		"												
23	"														
24	"														
25															
26															
27															
28															
29															
30															
31															

SCHEDULES OF LATITUDES AND LONGITUDES OF CAMPING PLACES NOS. 1-104, ON ROUTE OF ELDER EXPLORING EXPEDITION,

From June 6th, 1891, to January 2nd, 1892, compiled by Mr. L. A. Wells, Surveyor to the Expedition.

Depot Camp—Starting point near Mount Illbillee, latitude 27° 3′ 0″, longitude 132° 30′ 0″.

Camp No.	Latitude.			Longitude (approximate).			Camp No.	Latitude.			Longitude (approximate).		
	°	′	″	°	′	″		°	′	″	°	′	″
1	27	5	0	132	23	0	46	28	4	29	126	9	0
2	27	5	0	132	10	0	47	28	13	53	125	58	0
3	27	9	0	131	55	0	48	28	28	0	125	48	0
4	27	10	19	131	48	0	49	28	41	49	125	38	0
5	27	7	30	131	31	0	50	28	55	14	125	25	0
6	26	59	44	131	14	0	51	29	1	40	125	18	0
7	27	9	0	131	4	0	52	29	12	0	125	5	0
8	27	19	0	130	54	0	53	29	23	56	124	51	0
9	27	20	54	130	53	0	54	29	33	25	124	38	0
10	27	16	0	130	40	0	55	29	44	45	124	22	0
	(approx.)						56	29	54	35	124	9	0
11	27	28	0	130	38	0	57	30	5	12	123	54	0
12	27	33	35	130	34	0	58	30	14	5	123	41	0
13	27	32	30	130	28	0	59	30	25	48	123	28	0
14	27	25	0	130	23	0	60	30	25	45	123	20	15
15	27	27	0	130	9	0	61	30	25	0	123	8	0
16	27	20	19	130	5	30	62	30	44	31	122	57	0
17	27	20	19	130	4	0	63	30	54	0	122	45	0
18	27	16	0	129	57	0	64	31	6	7	122	32	0
19	27	13	0	129	52	0	65	31	17	0	122	38	0
20	27	11	0	129	48	0	66	31	30	45	122	45	0
21	27	9	0	129	30	0	67	31	44	3	122	41	0
22	27	4	0	129	24	0	68	31	57	44	122	35	0
23	26	55	0	129	8	0	69	31	50	56	122	45	0
24	26	50	0	129	58	0	71	31	42	3			
25	26	40	0	128	48	0	72	31	35	45			
26	26	32	0	128	36	0	73	31	26	20			
27	26	23	51	128	28	0	74	31	14	8			
28	26	18	50	128	20	0	75	31	6	30			
29	26	19	30	128	11	0	78	31	10	22			
30	26	13	0	128	1	0	80	31	11	5			
31	26	10	48	127	57	0	83	31	15	42			
32	26	7	30	127	47	0	84	31	15	2			
33	26	3	0	127	33	0	85	31	16	19			
34	26	8	0	127	32	0	89	30	58	56			
35	26	14	20	127	30	0	90	30	54	0	119	2	0
36	26	17	0	127	27	0	(Knutsford)						
37	26	30	13	127	15	0	91	30	49	0			
38	26	39	8	127	7	0	93	30	35	50			
39	26	51	0	127	0	0	94	30	26	10			
40	27	40	0	126	56	0	96	30	4	10			
41	27	10	40	126	52	0	97	29	58	30			
42	27	28	30	126	45	0	98	29	44	50			
43	27	36	10	126	41	0	99	29	32	0			
44	27	43	35	126	34	0	100	29	20	0			
45	27	54	32	126	21	0	104	28	38	35			

List of Heights and Positions of Camps, Vertical Measurements.
Heights marked with asterisk are taken by hypsometer.

Camp or Name of Place.	Height in feet above sea level.	Height in feet above base.	Camp or Name of Place.	Height in feet above sea level.	Height in feet above base.
Everard Range Camp	1950*		Sandstone Cliffs (between Cs. 41 & 42)	1680	
Mt. Illbillee	3010*	1060	Sandstone Ridge (near C. 44	1500	
Ferdinand Creek ...	1800		Camp 46	1300	
Camp 4	1575*		Camp 47	1100	
Camp 5	1580		Camp 48 (Mound Spring)	1150	
Camp 6	1575		Camp 49	980	
Camp 7	1550		Camp 52	850	
Camp 9	1540		Camp 54	1100	
Camp 11	1500		Camp 58	750	
Camp 12	1580		Between Cs. 59 and 60, on top of the sandhills	1050	
Camp 13 (base of Coffin Hill)	1590		Camp 60 (Queen Victoria Spring)	836*	
Coffin Hill	1800	210	Camp 62	1160	
Camp 14	1730		Camp 63	1000	
Camp 15	1700		Camp 64	1450	
Camp 17 (base of Mt. Watson)	1500*		Camp 65	1100	
Mt. Watson ...	2226*	726	Camp 66	1000	
Camp 19	1850*		Camp 68 (base of Fraser R.)	1250	
Mt. Sir Thomas ...	2535*	685	Camp 69 (Simon's Hill)	1236*	
Camp 20	1835		Peak of Fraser Range	2010*	765
Mt. Sawback (Lindsay)	2300	550	Camp 70	850	
Camp 22 (base of Mt. Sawback)	1750		Summit of Ridge between Cs. 70 and 71	1300	
Camp 27 (base of Skirmish Hill)	1335*		Camp 71	1200	
Skirmish Hill ...	1910*	580	Remarkable Quartzite Bluff, between Cs. 71 and 72	1300	
Camp 28	1475		Salt Lake, between Cs. 71 and 72	900	
Camp 29	1400		Camp 73	1500	
Camp 31 (Fort Müller)	1517*		Camp 74	1100	
Mt. Cooper (Cavenagh R.)	2175*	650	Bed of Lake Lefroy	1050	
Camp 33	1565*		Camp 75 (south of Mt. Monger)	1200	
Camp 35 (base of Mt. Squires)	1590*		Camp 76 (near Hunt's Well)	1250	
Mt. Squires... ...	2270	680	Depôt Hill (N. shore of Lake Lefroy)	1500	
Townsend R. (continuation)		220			
Terrace between Cs. 38 and 39	1600				
Camp 39	1100				
Sandstone Terrace (between Cs. 39 and 40)	1550				

Camp or Name of Place.	Height in feet above sea level.	Height in feet above base.	Camp or Name of Place.	Height in feet above sea level.	Height in feet above base.
Camp 78	1200		Camp 99 (Lake Moore country)	1100	
Camp 80	1600		Camp 100 (Warne Flats)	1000	
Camp 81	1650		Camp 101 (S. of Mt. Kenneth)	1150	
Camp 83	1750		Camp 102	1500	
Camp 84	1600		Camp 103 (Canning Hills, Broad's Station)	1600	
Claypan between Cs. 84 and 85... ...	1100		Camp 104	1200	
Camp 85	1150		Camp 105	1400	
Camp 86 (Southern Cross)	950		Camp 106 (Watson's Station)	1000	
Camp 88	1125		Camp 107 (Jones' Station)	950	
Camp 89 (Lake Deborah)	930*		Camp 109 (Lake Austin country)	1100	
Camp 91	1200		Camp 110 (Townsend's Station)	1400	
Camp 92	1500		Camp 111	1600	
Camp 93	1600		Camp 113 (Cruickshank's Station)	1550*	
Camp 94	1850				
Camp 95	1700				
Camp 96	1600				
Camp 97 (near Mt. Churchman)	1500				
Mt. Churchman (?)...	1800	260			
Camp 98	1400				

LICHENES.

By Dr. J. MUELLER.

[*Reprinted from "Hedwigia," heft 5, 1892.]

Trib. **Omphalarieae.**

1. Pyrenopsidium decorticans, J. Müll.

Thallus olivaceo-nigricans, demum decorticando obscure fusco-purpurascens, diffracto-areolatus ; areolae ½ mm. latae et 2-3-plo minores, convexulae, hinc inde paucae connatae, fertiles quasi in apothecium hemisphaericum vertice latiuscule foveolatum et sat regulare et laeve abeuntes ; discus poriformis ; sporae in ascis circ. 30 — 40, globosae et globose-ellipsoideae, circ. 5 — 7 μ longae ; gonidia saltem pro magna parte rubricosa, vulgo didyma, hyphis varie moniliformibus cincta.

Species nulli nisi septentrionali *Pyr. granuliformi*, Forss. Gloeolich, p. 60 (Norrl. Hb. Lich. Fenn., n. 354), affinis est et ab ea jam extus forma et colore areolarum laevium et ostiolis amplioribus differt.

S. A. Arcoeillinna, ad saxa silicea.

Trib. **Cladonieae.**

2. Clathrina retipora, J. Müll., L.B., n. 589 ; *(Cladonia retipora*, Flk., Clad., p. 181). W.A. Karolin.
3. Clathrina aggregata, J. Müll., L.B., n. 589 ; *(Cladonia aggregata*, Eschw. Bras., p. 278). W. A. Warrangering ; terricola.
4. Cladonia alicornis, var. firma, Nyl. Syn., p. 191. S.A. Wawee Waterhole ; Everard Range. W.A. Victoria Desert (Camps 62, 66).
5. Siphula caesia, J. Müll.

Podetia laxe caespitosa, circ. 6 — 12 mm. alta, suberecta, superne undique caesia, inferne ochraceo-pallida, et e basi subtereti longe albo-radiculosa, superne flabellatim divisa, divisiones compressae, crassae, 1—2 mm. latae, nonnihil crenato-lobulatae et apice bifido saepe transversim dilatatulae. Apothecia ignota. Gonidia vulgaria, globosa, circ. 7 μ late. In lobulis hinc inde occurrunt gibbositates erumpentes, majusculae, nigrescentes, initia apotheciorum, secus lineam leviter intra-marginalem

* With corrected geographic references.—Ed.

sitae, sed fructificationis elemente haud ostendunt. Affinis est *S. coriaceae*, Myl.

W.A. Terricola, in Fraser Range.

Trib. **Heterodieae.**

6. Heterodea Mülleri, Nyl. Syn. L. Nov. Caled., p. 9.
   S.A. Everard Range. W.A., Warangering aliisque locis.

Trib. **Usneeae.**

7. Usnea barbata, var. scabrida (Tayl.), J. Müll., Lich. Nov. Gran., n. 20.
   W.A. Ramulicola, in Fraser Range.
   — — var. xanthopoga, J. Müll., L.B., n. 1476.
   W.A. Ramulicola, in Fraser Range.
   — — var. elegans, J. Müll., L.B., n. 1476.
   W.A. Ramulicola, in Fraser Range.

Trib. **Parmelieae.**

8. Theloschistes chrysophthalmus, var. Sieberianus, J. Müll., L.B., n. 581.
   W.A. Ramulicola, Fraser Range.
9. Xanthoria parietina, Norm. Conat. praemiss, p. 17.
   W.A. Rami-ramulicola, in Fraser Range.
10. Xanthoria controversa (Mass.) v. laciniosa; *Parmelia parietina*, v. *laciniosa*, Duf.; Schaer. Enum., p. 51.
    W.A. Ramulicola, in Fraser Range.
11. Physcia stellaris, var. acrita, Nyl., Scand., p. 111.
    S.A. Ramulicola, in Everard Range.
12. Physcia obscura, Nyl. Syn., p. 112.
    S.A. Lignicola, Everard Range.
    — — — var. virella, Th. M. Fries, Scand., p. 142.
    S.A. Corticola, in Everard Range.
13. Parmelia hypoleuca, f. coralloidea, J. Müll., L.B., n. 1145.
    S.A. Everard Range.
14. Parmelia tiliacea, var. minor, J. Müll., L.B., n. 46; corticola.
    S.A. Everard Range. W.A., Fraser Range.
15. Parmelia rutidota, Hook. fil et Tayl., in Lond. Journ. of Bot., III., 1844, p. 645; corticola.
    S.A. Everard Range. W.A., Fraser Range; Karolin.
16. Parmelia conspersa, Ach. Meth., p. 205; saxicola.
    W.A. Fraser Range.
    — — — var. corallina, Krplh. Lichfl. Bay, p. 135.
    S.A. Everard Range.
    — — — var. hypocleista, Nyl., Syn., p. 391; saxicola
    S.A. Everard Range,

— — — f. isidiosa, J. Müll., L.B., n. 575; ad saxa et ad terram sabulosam.
S.A. Everard Range.
— — — var. stenophylloides, J. Müll. Thalli laciniae breves, angustiores, subadpressae, subtus pallidae; saxicola.
S.A. Everard and Birksgate Ranges.
— — — var. stenophylla, Ach., Meth., p. 206; saxicola.
S.A. Everard Range.
— — — var. isidiosa. Thallus modice isidiosus; saxicola.
S.A. Arcoeillinna; Everard Range. W.A. Victoria Desert.

17. Parmelia adpressa, Krplh., Lich. Glaz., p. 15. S.A. Arcoeillinna.
18. Parmelia congruens. Ach. Univ., p. 491, Sw. L. Amer., t. 4; ad terram sabulosam.
S.A. Everard Range. W.A. Fraser Range; Karolin.
19. Parmelia amphixantha, J. Müll., L.B., n. 1312; ad terram.
W.A. Fraser Range.
20. Parmelia hypoxantha, var. major, J. Müll., L.B., n. 579; ad terram.
W.A. Fraser Range.
21. Parmelia dendritica. Pers. Wett., II., p. 16; saxicola.
W.A. Victoria Desert; Fraser Range.
— — — f. fuliginosa (Fr.); saxicola.

Trib. **Pannarieae.**

22. Heppia australiensis, J. Müll.

Thalli squamae obscure olivaceo-virentes, confertae, 1—2½ mm. latae, crassiusculae, ex orbiculari obtuse angulosae, v. margine demum minute adscendenti-microlobae; gonidia olivacea, glomeruloso-composita; apothecia solitaria, minuta, evoluta ¾—1½ mm. lata, rufofusca et plana, superficie scabrida, hinc inde annulo tumente thallino nano cincta, caeterum superficiem thalli non excedentia; epithecium fulvum, lamina caeterum hyalina; asci fusiformi-ovoidei, polyspori; sporae globosae, 3½—5 μ diametro aequantes.

Species insignis, ad *Heppiam psammophilam*, Nyl. Symb. Sahar. e Biskra, n. 10, accedens, sed macrocarpa, et sporae minores, squamae non insculptae.

S.A. Ad terram, Wa-wee Waterhole.

23. Heppia acarosporoides, J. Müll.

Squamae nigrescenti-olivacéae, ½—1 mm. latae, orbiculares, integrae v. margine leviter undulato-crenatae, fertiles hemisphaericae, monocarpicae, in margine adpressae, haud insculptae; gonidia olivacea, modice composita; apothecia demum ⅓ mm. lata, regularia, immersa, non prominentia thallina cincta; discus

nigro-fuscus, depressus, nudus ; sporae in ascis numerosae, $4\frac{1}{2}$—6 μ longae, globoso-ellipsoideae.

Affinis *H. australiensi*, sed squamulae aliae. Habitu bene accedit ad *Placodium castaneum*, Körb., sed gonidia sunt absolute alia.

S.A. Ad terram, Everard Range.

Trib. **Placodieae.**

24. Amphiloma murorum, var. miniatum. Korb. Syst., p. 111.
S.A. Saxicola, prope Mount Watson.
— — — — var. obliteratum, Korb Syst., p. 111.
W.A. Saxicola, Fraser Range.
— — — — var. areolatum, J. Müll.

Thallus crebre subareolatus, areolae periphericae hinc inde obsolete radiantes, turgidae, subtiliter crebre verruculosae, ochraceo-aurantiacae. Sporae ut in specie. Quasi forma oblitera varietatis *aurantiacae*. Saxicola.

S.A. Near Arcoeillinna Well.

25. Placodium fulgens, var. bracteatum (Ach.), J. Müll., Lich. Pers. n. 14.
S.A. Everard Range.

26. Placodium cervinum, var. percaenum (Schaer.), J. Müll., Lich. Pers. n. 23 ; calcicola.
S.A. Foot of Everard Range. W.A. Fraser Range.

27. Placodium citrinum, J. Müll., L.B., n. 1414.
Urceolaria citrina, Tayl. in Hook Journl. of Bot., 1847, p. 158.
Lecanora Xanthophana, Nyl. L. And. Boliv., p. 379.

Lichen in Australia centrali sicciore vulgaris, at rarius bene evolutus, habitu, magnitudine squamularum et colore flaviore aut magis virenti eximie varians, caeterum ad saxa et ad terram crescens.

S.A. Near Arcoeillinna Well, Everard Ranges, and various places in the vicinity.

Trib. **Psoreae.**

28. Psora decipiens, Hoffm., Lichenos., t. 43, figs. 1-3 ; Mass. Ric. p. 91 ; ad terram.
S.A. Everard Range. W.A. Victoria Desert (Camp 46).

29. Psora psammophila, J. Müller.

Thalli squamae $\frac{1}{2}$—2 mm latae, glauco-virentes, mutua pressione demum angulosae, caeterum orbiculares, planae, undulatim, gibboso-inaequales, undique adnatae ; apothecia $\frac{1}{2}$—1 mm lata, nigra, planoconvexa, primum tenuissime marginata, mox dein immarginata, saepe demum varie in majora composita confluentia,

intus nigra; epithecium et hypothecium nigrofusca; sporae octonae, ellipsoideae, 8—10 μ longae, circ. 6 μ latae.

A proxima *Ps. glauca* (Tayl.), J. Müll., L.B., n. 1423, recedit squamis planis, tenuibus, aliter coloratis et sporsis minoribus et colore thalamii.

S.A. Ad terram sabulosam, Wa-wee Waterhole.

30. Thalloidima australiense, J. Müll., L.B., n. 1158.

W.A. Ad terram prope Warangering.

31. Catolechia glomerulans, J. Müller.

Thallus olivaceo-nigricans, squamulosus; squamulae parvae et glomeruloso-aggregatae, bullato crassae, ambitu obtuse lobulatae, totae adnatae; apothecia $\frac{1}{2}$ mm lata, sessilia, nigra, plana, opaca, tenuiter et vix prominenter marginata, dein immarginata; epithecium nigrofuscum, lamina fuscidula; hypothecium late obfuscatum, paraphyses conglutinatae; sporae in ascis angustis 8-nae, 2-loculares, 12—14 μ longae, 5—6 μ latae, ellipsoidae et obovoideae, utrinque late obtusae, media obsolete constrictae. Thallus primo intuitue globoso-crustaceo in glomerulosum disruptus videtur, at squamulae cujusvis pulvinuli in peripheria hinc inde distincte leviter lobatae sunt. Apothecia in quoque glomerulo plura.

Prope *C. badiam* (Fr.), J. Müll., Lich. Costar., No. 58, inserenda est.

W.A. Ad terram subulosam rubidam prope Warangering.

32. Catolechia subcoronata, J. Müller.

Thalli squamae olivaceo-albidae, adnatae, orbiculares et obtuse angulosae, sat confertae, planae, gibboso-inaequales et demum reticulatim insculptae, circ. 1—$1\frac{1}{2}$ mm. latae; apothecia nigra, circ. 1 mm. lata, erumpentia, margine thallino accessorio grosse dentato-coroniformi et mox evanescente cincta, demum convexa et immarginata, nuda et opaca; epithecium et hypothecium nigrofusca; sporae 8-nae, ellipsoideae, subbiscoctiformes, biloculares, 12—16 μ longae, 5—7 μ latae. Ad terram.

Prima fronte potius speciem *Thalloidimatis* simulans, sed sporae ut in *Buellia*.

S.A. Everard Range. W.A. Warangering.

33. Catolechia marginulata. J. Müller.

Thalli squamae laete glaucae, convexae, crassulae, 1—$1\frac{1}{2}$ mm. latae, nonnihil obtuse angulosae, ambitu linea albicante cinctae et superficie polito-laeves; apothecia nigra, copiosa, $\frac{1}{2}$—1 mm. lata, novella haud coronata, sessilia, semper tenuiter nigro-marginata; epithecium et hypothecium nigrofusca; sporae 8-nae, ellipsoideae, circ. 12 μ longae et 7 μ latae.

Affinis *C. subcoronatae*, sed sqamularum minorum et crassiorum et eleganter marginatarum superficies alia et apothecia juniora non coronata.

S.A. Ad saxa arenacea prope Everard Range.

Trib. **Lecanoreae.**

34. Callopisma aurantiacum, Mass., Syn. L. Blasten, p. 9; saxicola.
S.A. Everard Range. W.A. Fraser Range.

34a. — — — var. granulare, J. Müll., L. Parag., n. 82.
W.A. Corticola, Fraser Range.

35. Lecanora subfusca, var. campestris, Schaer., Enum., p. 75; saxicola.
No locality.

36. Lecanora caesio-rubella, Ach. Univ., p. 366.
W.A. Corticola, Fraser Range.

37. Lecanora sphaerospora, J. Müller.

Thallus albidus, confertim v. sparsim glebuloso-areolatus; areolae irregulariter orbiculares, convexae, impresso-punctatae, gonidia globosa (vulgaria); apothecia in areolis solitaria iiscum primum, apothecia late albo marginata formantia, demum tenuiter albo-marginata; margo vix prominens, undulatus, intus linea tenui nigra zeorina haud emergente praeditus; discus planus, 1—1½ mm. latus, caesio-niger; epithecium nigrofuscum; hypothecium hyalinum; sporae in ascis 8-nae (semel 12 visae), vulgo biseriales, semper accurate globosae, diametro 6—8 μ acquantes.

Species forma sporarum insignita, habitu ad *L. sordidam*, Th. Fr., accedens et statu juniore fere *Lecanoram Hoffmanni* (sed albior) referens.

W.A. Saxicola, Victoria Desert et Fraser Range.

38. Lecanora calcarea, Smflt., var. caesio-alba; *Aspicilia contorta*, var. *caesio-alba*, Körb. Syst., p. 166.
W.A. Saxicola, Fraser Range.

39. Lecanora pallescens, Fr., Lich. Europ., p. 132.
W.A. Corticola, Fraser Range.

40. Rinodina Bischoffii Mass. Framm., p. 25.
W.A. Saxicola, Fraser Range.

41. Diploschistes scruposus, Norm., var. arenarius (Ach.). *Urceolaria scruposa* var. *arenaria*, Ach. in Schaer., Spicileg, p. 75.

W.A. Ad terram arenosam, in Fraser Range et in ejusdem vicinitate.

Trib. **Lecideeae.**

42. Blastenia ferruginea Massal. Syn. Lich. blasteniosp., p. 14.
W.A. Corticola, Fraser Range.

43. Lecidea planata, J. Müll., L.B., n. 1082; *L. plana*, Krplh Austral. n. 113 (non Lahm).
W.A. Ad terram prope Warangering.

44. Lecidea (s. Sarcogyne) pruinosa, var. minuta ; *Sarcogyne pruinosa* v. *minuta*, Mass. Sched. crit. n. 335.
W.A. Saxicola, Fraser Range.
45. Buellia tetrapla (Nyl.), J. Müll., L.B., n. 1312.
W.A. Corticola, Fraser Range.
46. Buellia inturgescens, J. Müller.

Thallus ochroleuco-albido, crassiusculus, diffracto-aroelatus ; areolae primum confertae, planae, angulosae, dein subdistantes et turgido-convexae, laeves sed opaca, sessilia, $\frac{1}{2}$—$\frac{4}{5}$ mm lata, e plano et tenuiter marginato demum convexa et immarginata ; epithecium caerulescenti-aut virenti-nigrum ; hypothecia fuscum ; sporae 8-nae, 9—11 μ longae et circ. 6 μ latae.

A proxima abyssinica *B. toninioide*, Bagl., recedit apotheciis magis superficialibus, nec ex immerso adpressis et epithecio non fusco.

S.A. Camp 14, on granite.
47. Buellia spuria (Schaer.), Körb. Par., p. 183.
Saxicola. S.A. Arcoeillinna ;
48. Buellia subalbula, J. Müll., Lich. Aegypt., n. 49.
Lecidea subalbula, Nyl., Lich. Angol., p. 11 et Lich. Larbal, n. 12.
S.A. Calcicola, Everard Range. W.A. Fraser Range
49. Buellia stellulata (Tayl.), Mudd Man., p. 216.
Saxicola. W.A. Cavenagh Range.
50. Buellia desertorum, J. Müller.

Thallus argillaceo-fuscus, crebre et minute diffracto-areolatus, areolae subcontiguae, angulosae, planae, medio concaviusculae, vix apotheciis aequilatae ; apothecia $\frac{1}{4}$—$\frac{1}{3}$ mm. lata, sessilia, juniore margine accessorio fugace pallido et tenuissimo mox evanescente praedita, demum alte convexa ; epithecium et hypothecium fusca ; sporae 8-nae, globoso-ellipsoideae, 7—9 μ longae et 6—7 μ latae, 2-loculares.

Juxta *B. fuscellam*, J. Müll, L.B. n. 1,438, locanda est, a qua jam apotheciis non adpressis mox elato-convexis et colore thalli differt.

W.A. Saxicola, Victoria Desert.

Trib. **Endopyrenieae.**

51. Endocarpon Helmsianum, J. Müller.

Thalli squamae fuscescenti-argillaceae, 5—13 mm. latae, suborbiculares, margine paullo angulosae aut leviter crenato-lobulatae, planae v. planiusculae, subundulato-inaequales, coriaceae, demum reticulato-insculptae, polycarpicae, subtus copiose et longe nigro-rhizinosae ; perithecia innata, integre nigro-globosa, circ. $\frac{1}{3}$ mm. lata ; ostiolum haud prominens, disculo orbiculari thallino fere $\frac{3}{10}$ mm. lato pallido-nigrescente centro pertuso et

linea nigra circumscripto indicatum ; sporae in ascis geminatæ, superpositae, fuscae, circ. 35—50 μ longae et 12—18 μ latae, ambitu valde ludentes, crebre parenchymatosae ; gonidia thalli subglobosa, 6—9 μ lata, hymenialia valde copiosa, 4—8 μ longa, vulgo 2—3-plo longiora quam lata, cylindrico-ellipsoidea.

Est species insignis, robusta, macrocarpa, gonidiis hymenialibus oblongatis.

S.A. Ad terram, Birksgate Range.

52. Endopyrenium hepaticum, Körb., Par., p. 302.
No locality.

Trib. **Pyrenuleae.**

53. Verrucaria calciseda, Dc., Fl. Fr., p. 317.
W.A. Saxicola, Fraser Range.

Trib. **Leprariaceae.**

54. Lepra citrina, Schaer., Spicil., p. 2.
S.A. Corticola, Everard Range.

FUNGI.

By Dr. M. C. COOKE.

Herbarium, Royal Gardens, Kew.

Polyporus sanguineus, *Meyer.*
S.A. Everard Range.
Fomes ramosus.
Trametes gusapatus, *B.*
Lenzites striata, *Fr.*
Polysaccum australe.
W.A. In sand, Victoria Desert (C. 58).
Geaster fimbriatus, *Fr.*
Geaster striatus, *D.C.*
W.A., Fraser Range.
Geaster Drummondi, *B.*
Podaxis carcimonalis, *Fr.*
Stephensia arenivaga, *Cooke* and *Masse*, "Grevillea," vol. XXI., No. 98, Dec., 1892.

Subglobose, irregular, or at length collapsed and cerebriform (4 to 6 c.m. diam.), pale, soft, becoming indurated, accumulating particles of sand, which become closely adherent; gleba soft, dirty-white, shrinking and becoming irregularly lacunose; asci clavate; sporidea 8, irregularly clustered globose, smooth, hyaline, 10 μ diameter.

S.A. On sandy soil, near Camp 9.
Diploderma sabulosum, *C.* and *M.*, op. cit.

Subglobose, 2-3 c.m. diam., pallid. External peridium thick, subgelatinous, collecting grains of sand, and becoming consolidated into a firm subglobose ball. Inner peridium membraneous, persistent, soon free within the outer hard shell, silvery white. Capillitium radiating, consisting of parallel fibres. Gleba dirty-white. Spores elliptical, smooth, 14 × 7 μ, pallid with a faint tinge of ochre.

W.A. On sandy soil, Victoria Desert.

CHARACEÆ.

By Dr. Nordstedt, of Lund.

Chara succincta, *Al. Braun.*
S.A. Cootanoorina.
Nitella cristata, *Al. Braun.*
W.A. Karoling.

ORTHOPTERA.

By J. G. O. TEPPER, F.L.S.,

Entomological Curator, Public Museum, Adelaide.

The Orthoptera collected by Mr. R. Helms, the naturalist of the expedition represents most of the groups of the order, the collection comparing very favourably in number and species with even the richest of the other orders. Considering the difficulties the capture and preservation of these insects present, the collection is so far satisfactory, but the many new forms exhibited among the comparatively small number indicate that very much is still to be learned.

There have been and still are only a few specialists for the order even in the Old World, and none in Australia. Their works, moreover, are published in several languages and difficult to obtain, forming mostly parts of the transactions of scientific societies, and only obtainable at irregular opportunities. It has therefore been impossible for me to identify or recognise the greater number with the certainty desirable, and while of these only a general and approximate list can be given, several families have been examined exhaustively, and revealed a number of forms new to science, so far as I am able to judge. As the collection of the requisite literature proceeds, and my other duties permit, detailed descriptions will be drawn up and published in due course.

The 101 specimens placed in my hands comprise about 26 genera, and 30—40 species. Owing to the delicacy and brittleness of their organs, many suffered considerably during the long, rough transit, notwithstanding the great care taken by the collector.

Forficularia (Earwigs).

Not represented.

Blattodea (Cockroaches).

Apolita decorata, *Tepper*. Fraser Range. One larva.

Ischnoptera longiuscula, *Walk.* (?). Cootanoorina. Three adults.

Epilampra Fraseriana, *Tepper*. Fraser Range. Two adult males, and one female larva.

Polyzosteria pubescens, *Tepper*. Fraser Range. Three adult males and two larvæ.

Polyzosteria Mitchelli, *Angas*. Victoria Desert, &c. Ten specimens.

Platyzosteria armata, *Tepper*. Fraser Range. One male, two females.

Platyzosteria albomarginata, *Brunner*. Barrow Range. One male.

Anamesia Lindsayi, *Tepper*. Everard Range. One male and female.

Pseudolampra punctata, *Tepper*. Between Victoria Spring and Fraser Range. One pair of adults and one larva.

Drymaplaneta obscuripes, *Tepper*. Fraser Range. One immature male.

Mantodea (Mantids).

Mantis sp. 1. Victoria Desert. One specimen. It resembles our common small green mantis, but is much smaller, &c.

Mantis sp. 2. Fraser Range. Two adults and one larva. It belongs to the type of *M. latistylis*, but different in many characters. It also occurs in other parts of South Australia. The native name is "Komvan," according to Mr. Helms.

Phasmodea (Stick-insects).

Podacanthus viridiroseus, *Cast.* Murchison. One female.

Podacanthus sp. Fraser Range. One male and four very young larvæ.

Lopaphus (?) sp. Fraser Range. One female.

Cyphocrania sp. Fraser Range. One female. Probably a dwarf form of *C. Pasymachus*, or closely allied.

Acridiodea (Common Locusts, antennæ short).

Choriphistes sp. Victoria Desert, Fraser Range. Two males, five females.

Cyrtacanthacris exacta, *Walker*. Same as last. Three adult specimens.

Tropinotus sp. Fraser Range. One male, two females, one nymph.

Eremobia (?) sp. Fraser and Barrier Ranges. Two adults and one nymph.

Rhomalea (?) sp. Victoria Desert. One pair of adults, of which the collector remarks, that the colour of their body so well harmonised with the rocks or ground they frequent, that it is difficult to detect them.

Pachytilus (Epacromia) sp. Everard Range. One female; a male from the Fraser Range appears to belong to the same species. Both are different from our common locust. According to the collector's note, the native name is "Yindilka."

Dactylotum (?) sp. Mount Squires, &c. Four adults (three males, one female) and six larvæ, apparently belonging to the same species, which is found in the Mount Lofty Ranges, near Adelaide. They are referred provisionally to this genus, and may require a new genus for their reception.

Besides the above, there are 13 specimens of small sizes, and from the Fraser Range chiefly, which belong to several species, but which I cannot at present locate with any reliability, on account of the lack of the requisite literature. I also beg to point out that for the same reason the names given are only provisional, indicating the affinity of the repective insects, until by more critical study their true position can be defined. It is surmised that a fair proportion will prove new.

Locustodea (Longhorned Locusts).

A. PHANEROPTERIDÆ.

Dictyota Elderi, *Tepper*. Trans. Roy. Soc. S. Aust., XV., p. 99. Mount Squires. One male.

Taeniomena Fraseriensis, *Tepper*, op. cit., p. 108. Fraser Range. One male.

B. LOCUSTIDÆ.

Mecopoda (?) sp. Mount Squires. One female.

Saga (?) sp. Fraser Range. One female.

C. GRYLLACRIDÆ.

Paragryllacris deserta, *Tepper*, op. cit., p. 162. Cootanoorina. One adult male and three larvæ. Native name, "Billarbi" (*R. Helms*).

Ametrosomus Helmsi, *Tepper*, op. cit., p. 160. Blyth Hill and Barrow Ranges. Two adult males.

Gryllodea (Cricket-like Insects).

Schoenobates (?) sp. Fraser Range. One female. Quite unique in form, and probably new.

Among the Pseudo-Orthoptera (or Pseudo-Neuroptera) is a single Dragon Fly (*Agrionidæ*) and several species of Ant-lions (*Myrmelionidæ*). These, however, are reserved for critical study. When the requisite literature has been obtained they will be further reported on. It may, however, be remarked that the former appears to be identical with one of our common species, and the latter different from anything hitherto found in the settled part of the province.

VERTEBRATA.

By E. C. STIRLING, M.A., M.D., C.M.Z.S., Hon. Director South Australian Museum, and A. ZIETZ, Assistant Director S.A. Museum.

[Plates VI. and VII.]

MAMMALIA.

The mammals collected by Mr. R. Helms are comparatively few in number, and represent only a few species, but the journey has added some interesting information respecting their distribution. The collection comprises twenty specimens, including one skull and two skeletons, and represents eight species.

Myrmecobius fasciatus, *Waterhouse.*

Everard Range. One dried skin.

Trichosurus vulpecula, *Kerr.*

One dried skin of this well-known and widely-distributed species from the Everard Range. A rufous tinge is particularly conspicuous on the scapular region and neck.

Lagorchestes hirsutus, *Gould.*

One old male (skin), one young, sex unknown (skin), and one young male taken from the pouch (in spirit). These were taken in the Porcupine grass *(Triodia irritans)* country, south of the Barrow Range, before the exploring party entered the Victoria Desert. Gould's type, of which he gives an excellent figure in his "Mammals of Australia" was obtained in Western Australia.

The following description refers to the largest male specimen, which has been mounted. It is apparently an adult:—

Rhinarium nearly wholly covered with gray hair, lips white. General colour above finely grizzled-grey, intermixed with rufous-brown, which is more conspicuous on the rump and on the outside and back of legs. The fur of the back is, for half its length next the skin, nearly black; a yellowish-brown-tinted area, around the eye, extends to root of ear; back of ears grizzled-grey, their insides and edges white. Arms, hands, front of legs and feet pale. Tail short-haired, black above and towards the point, grey on sides and root, its under-surface with short white glossy hair. Length of hindfeet four and a half inches, of tail ten inches, total length of specimen (stuffed) about thirteen

inches. The tail, which is much laterally compressed, is pyriform in section, with the broad end uppermost, and has a distinct tendency to coil inwards for about its terminal half. This feature is very-well shown in the youngest specimen preserved in spirit. The larger male has much resemblance, in general appearance, to a female specimen of *L. leporoides* in the S.A. Museum. Both specimens are about of equal size, but *L. leporoides* has a more nearly uniformly light-coloured tail and proportionally longer hindfeet. The longer and more slender tail of *L. hirsutus* is conspicuously dark and the hindfeet are fully an inch shorter. The skulls of both specimens show no marked differences. The younger skin of an individual rather more than half-grown (mounted) has the skin injured in such a way that the sex cannot be distinguished. It has the brown zone round the eye prolonged to the sides of the muzzle.

Mr. Streich informs us that this animal appears to be numerous in the northern parts of the Victoria Desert, where it often falls the prey to the Wedge-tailed eagle.

Onychogale lunata, *Gould.*

A young male from the Everard Range.

The white mark behind the base of the forelimb is not nearly so distinct as is shown in Gould's figure. A female collected on the transcontinental journey of His Excellency the Governor, the Earl of Kintore, has apparently a proportionally longer tail, but it is possible that this is owing to a deficiency of the tip in the former case.

Petrogale lateralis, *Gould.*

Male, female and young (taken from the pouch) obtained at, or near, the Barrow Range.

These specimens are more conspicuously marked than others which were collected by Dr. Stirling in the neighbourhood of Alice Springs in 1891. The dark-brown markings are of a deeper tinge, but the whitish or yellowish markings more faintly shown. Beyond these we are unable to detect any other differences which would justify a specific separation of these specimens from those collected at Alice Springs. It seems to have a wide range in the mountainous or rocky districts of the interior. Those in the British Museum were collected on the N.W. coast and Swan River District, W.A.

Macropus robustus, *Gould.*

One skull, Victoria Desert.

Hapalotis Mitchelli.

Three immature specimens, Fraser Range. This species has a wide range in the interior of Australia.

Mus albocinereus (?), *Gould.*

A small species of *Mus* from the Murchison District.

Tail, 3·72 inch; head and body, 3·25 inch. The fur has a brownish-grey tinge, the under-surface lighter coloured, feet and lips whitish.

It agrees approximately with the description of *M. albocinereus*, Gould; but in the present imperfect knowledge of the Australian representatives of this group we cannot confidently affirm that this specimen belongs to that species.

AVES.

This series consists of eighteen skins, two skeletons, eight nests and sixteen eggs.

We have throughout adopted the nomenclature of Dr. Ramsay's "Tabular List of Australian Birds."

Aquila audax, *Lath.*

Victoria Desert. One specimen, apparently an old female. Above and below, blackish-brown; neck rufous, under tail-coverts of a rusty tinge; median wing and upper tail-coverts yellowish-brown. Each feather is shaded with dark-brown in the centre.

Two eggs (taken from the same nest in a Bloodwood-tree (*Eucalyptus tessellaris*) between Camps 23 and 24 (Blyth Range) show the usual markings of this species. One is smaller and also much lighter-coloured than the other.

Aquila morphnoides, *Gould*

One egg, which we refer to this species, was taken at Mt. Squires from a nest built in a Eucalyptus-tree. The bird was not seen at the time.

Hieracidea berigora, *V.* and *H.*

Three males (Barrow Range), and one female (Cavenagh Range). These birds correspond most nearly with Mr. Sharpe's description of the species in the British Museum Catalogue.

Hieracidea orientalis, Schlegel. One female. Murchison District. This specimen answers most nearly to the species described under this name in the British Museum Catalogue. In the South Australian Museum is the skin of a female shot in the neighbourhood of Lake Albert, which conforms to the description of *H. berigora*, while two of its young, taken from the nest at the same time and kept until six months old, agree in all essential particulars with the description of the young of *H. orientalis*. From this fact, and from careful inspection of a large series of birds from various localities which approximately answer to the descriptions either of *H. berigora* or of *H. orientalis*, it is

evident that both these alleged species are subject to considerable colour-variations; and we have been unable, after careful examination and measurements, to detect any such differences as should entitle them to be ranked as distinct. We, therefore, consider that Schlegel's *H. orientalis* is merely a variety of *H. berigora*, into which latter, as the type of the genus, the former should be merged. We can, further, detect no difference between eggs in the South Australian collection which are ascribed respectively to the two species.

A nest of *Hieracidea*, sp., was found upon the burnt trunk of a tree, about three feet from the ground, in the Victoria Desert (Camp 57).

CHERAMŒCA LEUCOSTERNA, *Gould.*

Camp 9. One specimen.

OREOICA CRISTATA, *Lewin.*

Barrow Range. One male which conforms with Gould's description.

Oreoica sp.—A second male specimen of *Oreoica*, considered by Mr. Helms to differ from *O. cristata*, because the blacks of the Barrow Range district distinguish it by a separate name, is possibly the same bird in its immature plumage, but as the specimen previously referred to and a female of the same species from Mildura (Victoria) are all we have for comparison, it would be unsafe at present to declare the bird under consideration to be a distinct species. This specimen has the base of the beak light-brown. Both specimens from the Barrow Range appear to have the beak proportionally stronger and wider vertically than the Mildura-specimen.

The black markings on the head and breast, and also the white face, are very faintly indicated by darker and lighter shades of brown. The crown of the head, which in the male specimen of *O. cristata* is deep black, is in this specimen very faintly marked and mixed with grey. The greyish tinge of the neck gradually changes into fawn-colour towards the rump, and the latter tint is more vivid on the upper- and under tail-coverts. Under surface and sides fawn-coloured, the latter being the darker. Feathers of the upper surface, wing and tail brownish, margined with fawn-colour.

CHLAMYDODERA GUTTATA, *Gould.*

Three beautiful male specimens of this species, which apparently is still rare in Museums, were collected in the Barrow Range. They agree with *C. maculata* in respect of size, but the colourings are far more vivid.

Mr. Helms informed us that this bird is not uncommon in the locality mentioned.

Epthianura tricolor, *Gould.*

A male bird and a nest containing two eggs which, according to Mr. R. Helms, had undergone a week's incubation, were collected near Arceoillinna Well, S.A.

A second nest, also containing two eggs, was found near Camp 1 (Everard Range).

Both are composed of fine grass-stems, rootlets, and the silky-white stems and leaves of some "everlasting."

Epthianura aurifrons, *Gould.*

A nest containing three eggs was obtained near Arkaringa Creek, S.A.; it was found in the midst of a small saltbush.

The description of the bird seen near the nest by Mr. Helms undoubtedly refers it to this species. The nest is composed of fine grass-stems, rootlets, and dried yellow flowers.

Cinclosoma castaneonotum, *Gould.*

One male bird in spirit, nest and one egg. With regard to these specimens Mr. Helms notes that the nest was found in the Victoria Desert in Spinifex *(Triodia irritans)*, by Mr. D. Lindsay. It contained one egg only, which was in an advanced stage of incubation. Mr. Lindsay asserts that the nest is made by this bird. Two other eggs were obtained near the Everard Range, but they were too decomposed for preservation.

The egg taken from the above-mentioned nest is much more elongated than two others which will be mentioned in the next paragraph. It is also much more minutely punctated, but bears undoubtedly the character of a "Cinclosoma" egg.

A second nest and two eggs, which apparently belong to this species, are accompanied by the following note from the collector: —"The nest and two eggs were found during a flying trip about thirty miles south of Camp I., Everard Range. Unfortunately, the structure of the nest was such as to prevent my being able to preserve it intact, in the circumstances under which we travelled on that occasion, although I took the greatest pains to do so. It was found at the base of a low bush, of the bark of which it is constructed. The bird itself I did not see, but the natives told me their name for it was *milka*. On seeing the egg they said, '*Milka nokum*,' *nokum* being egg."

The remains of the nest consist of narrow strips of bark, and it was evidently constructed on the same plan as that of *C. punctatum*, which, according to Mr. North, is also a rather-loosely built structure composed of fine strips of bark, grass, and leaves.

One of the eggs (A) is bluish-white, freckled with sepia-brown markings intermingled with others of a bluish-grey, which latter

appear as if underneath the surface of the shell; some of these markings are large, others very minute.

The second egg (B) is creamy-white, but the markings are much larger, especially towards the larger end.

Dimensions.—(A) 1·19 x 0·81 inch; (B) 1·18 x 0·67 inch.

CACATUA ROSEICAPILLA, *Vieillot.*

Barrow Range; two specimens.

REPTILIA.

ORDER LACERTILIA.

The large number of one hundred and sixteen specimens, representing thirty-seven species, proves the abundance of this class of animal life in the arid regions of Australia traversed by the Expedition and also indicates the zeal and energy of the collector under the peculiarly difficult circumstances of Australian exploration.

Five species of this order have been hitherto undescribed; of these four were collected for the first time by the Elder Expedition and a full description of them is here given. One species having been previously collected by Dr. Stirling on the occasion of His Excellency's transcontinental journey, its description is reserved for the zoological report of that expedition shortly to be published.

The classification and details of measurement are those adopted by Boulenger in the "Catalogue of Lizards in the British Museum Collection."

The following families are represented:—Geckonidæ, 8 species; Pygopodidæ, 3 species; Agamidæ, 10 species; Varanidæ, 2 species; Scincidæ, 14 species.

Family GECKONIDÆ.

NEPHRURUS PLATYURUS, *Boul.*

One specimen taken at Victoria Springs and two others between the Everard and Fraser Ranges; found under tussocks of Spinifex grass *(Triodia irritans).*

Total length of the largest specimen	88 mm.	
Head	23 "	
Body	50 "	
Tail	15 "	(reproduced)
With of head	20 "	
Length of forelimb	29 "	
Length of hindlimb	36 "	

The locality, Adelaide, as stated in the "British Museum Catalogue," is incorrect; this species inhabits the dry waterless country of the interior of the Australian Continent.

Rhynchœdura ornata, *Günther.*

Native name, "Piur."

Two specimens of this little-known lizard from the Everard Range.

Total length	86 mm.
Head	9 "
Body	43 "
Tail	34 "
Width of head	8 "
Length of forelimb	16 "
Length of hindlimb	19 "

Ground-colour reddish-brown, largely and irregularly reticulated with blackish-brown and marked with large round whitish spots, of which the larger ones, of about 2 mm. diameter, form two lateral rows In one specimen these spots form seven curved lines on the back with the concavity towards the head ; in the other these spots are not so regularly arranged. Upper part of the head of a ground-colour, similar to that of the body. A row of three to four white spots commencing midway between the nostril shields extends backwards as a median line to midway between the eyes. Upper eyelid dark, but very distinctly marked with white in front of the eye. The tip of the beak-like snout is white. A blackish curved band extends across the occiput. Underside cream-coloured, without any markings. The two specimens from which this description has been compiled were fresh, and well-preserved in spirit, but one had lost its tail.

Gymnodactylus Miliusii, *Bory.*

Between Fraser Range and Southern Cross. November, 1891.

Only one specimen of this common and widely-distributed species was collected. It has a total length of about 60 mm.

Heteronota Bynoei, *Gray.*

Two specimens collected ; one at or near the Barrow Range, the other between the Fraser Range and Southern Cross (Yilgarn). The former is an immature specimen, the second of about 100 mm. total length. This species has a wide range.

Diplodactylus spinigerus, *Gray.*

Native name, "Yed."

Fraser Range ; three specimens.

Total length of largest specimen, 90 mm.

Diplodactylus tessellatus, *Günther.*

Everard Range ; two specimens.

A patch of curved conical spines on each side at the root o

the tail, their length being in one specimen about 1 mm., in the other the spines are only half this length. Fourteen pairs of enlarged tubercles on the dorsal surface of the tail. Between the rings bearing these large tubercles are rings with generally three to four rows of smaller tubercles, which are equal in size to those on the dorsum. The second specimen has similar rings of tubercles on the tail, which latter, however, appears to have been reproduced. This is the first time that a specific locality has been assigned to this species.

Diplodactylus Elderi, *spec. nov.* Pl. VI., figs. 1 and 1*a*.

Barrow Range; one specimen.

Head oviform, convex; snout rounded, a little longer than the distance between the eye and ear-opening, and more than once and a-half the diameter of the orbit; ear-opening minute, oblong, vertical, 1 mm. long. Body moderately elongate, depressed. Limbs moderate; digits much depressed, with large transverse lamellæ inferiorly, five being under the fourth toe, of which the distal is incised and cordiform.

Colour.—Brownish-grey above, covered with small smooth granules, intermixed with larger ones of different sizes, which are very white and glossy; these form the centre of black annuli, which are sometimes confluent and arranged in very irregular disposed oblique or transverse rows; on the sides of the body they are more scattered, and become smaller on the limbs. Under-surface light-coloured; on the belly large whitish spots form two median and two lateral longitudinal rows. Tail short, pyriform.

Total length	...	...	...	...	65 mm.
Head	...	...	...	...	13 "
Body	...	...	...	...	38 "
Tail	...	...	...	...	14 "
Width of head	...	...	...		10 "
Length of forelimb	...	...	...		17 "
Length of hindlimb	...	...	...		18 "

Gehyra variegata, *Dum. & Bibr.*

This widely-distributed species was obtained at the following localities:—Two specimens, Barrow Range, one of 110 mm. total length, very light-coloured and indistinctly marbled with darker shades; the second (97 mm.) dark grey, variegated with darker shades. One immature specimen (55 mm.), between Barrow and Everard Ranges. One specimen (85 mm.), Fraser Range, with irregular dark bands across the back. One immature specimen (56 mm.) from Queen Victoria Springs, light greyish, variegated with darker shades; small white spots scattered over the head,

each corresponding to three or four tubercles. One immature specimen (62 mm.) with a dark streak crossing each eye and continuing to about the middle of the back.

Fam. PYGOPODIDÆ.

PYGOPUS LEPIDOPUS, *Lacep.*

One specimen of this well-known lizard from the country between the Queen Victoria Springs and Fraser Range has the following measurements :—

Total length	260 mm.
Head	13 "
Body	85 "
Tail	162 "
Width of head	7 "
Length of hindlimb	4 "

Slate-coloured with three dorsal longitudinal rows of elongated blackish spots ; throat uniformly salmon-coloured without markings.

The second specimen, a female (with well-developed ova), taken at Yilgarn, is uniformly slate-coloured on the dorsal aspect and pinkish below. A number of indistinct darker vertical streaks slanting forwards on each side of the anterior part of the body, gradually disappearing towards its middle.

DELMA IMPAR, *Fisch.*

One specimen found under "Spinifex" near Everard Range.

Total length	265 mm.
Head	10 "
Body	55 "
Tail	200 "
Width of head	5 "
Length of hindlimb	3 "

Dark olive green on the back and head, the sides of the body and under-surface white. Each scale of the back and sides of the body has a dark centre, thus forming fourteen dark longitudinal lines. Ventral scales with dark spots in the centre. A second specimen of the same size and with similar markings was obtained in the Barrow Range.

LIALIS BURTONI, *Gray.*

Two specimens ; 30 miles south of Camp. 1, Everard Range. One specimen approaches most nearly to Boulenger's Var. D. of this species.

Length of body	95 mm
Head	8 "
Tail	? (incomplete).

Length of snout about equal to distance from eye to ear-opening. Upper-surface slate-coloured; a vertebral line and two lateral lines of a darker shade. The dark vertebral line divides into two separate lines on the neck, which unite again at about two-thirds of the distance between the eyes and tip of the snout. A white labial band is prolonged along the sides of the body; this band is bordered on each side by minute white spots. Under-surface light grey; a white line along the middle of the throat, which bifurcates at about 20 mm. distance from snout, and the two branches extend over the tail.

The measurements of the second specimen are as follows:—

Total length	303 mm.
Length of body	177 "
Head	23 "
Tail	103 "

The ground-colour of the upper-surface is dark-grey, minutely punctated with brown; three dark-brown lines along the back; under-surface with white spots, which are margined with a brick-red colour. Length of snout equal to distance from eye to ear-opening.

Fam. AGAMIDÆ.

AMPHIBOLURUS MACULATUS, *Gray.*

Three specimens—two apparently adult and one young—of this beautiful lizard were obtained in the Barrow Ranges, and a fourth in the Victoria Desert near Queen Victoria Springs.

All these agree with Boulenger's description except in respect of their markings, which are as follows:—Above brick-red with a series of small bluish-grey spots along the vertebral line. The lateral lines are composed of similar spots, which are partly confluent. Four bluish-grey lines mark the upper-surface of the anterior third of the base of the tail; the two median then becoming confluent, three lines are continued to the tip. The remainder of the tail, sides of body, head, throat as well as a large patch, which covers most of the under-surface and the inner-surface of the hindlimbs are deep-black, but a narrow yellowish uncoloured streak on each side of the body is left, which connects the forelimbs with the hindlimbs. The remainder of the under-surface as well as the lips are yellowish-white.

	Sp. A.	Sp. B.
Total length	163 mm.	175 mm.
Head	15 "	15 "
Body	36 "	40 "
Tail	112 "	124 "
Width of head	12 "	12 "
Length of forelimb ...	24 "	24 "
Length of hindlimb ...	48 "	48 "

The ∧ shaped black mark on the throat to which Boulenger refers to in his description is not traceable in our specimens; but as we have seen it absent also in specimens of *Amphibolurus Adelaidensis* (the whole throat being sometimes uniformly black), we have no doubt that this feature is subject to great variation. The third specimen (the young one) has dark mottling on the the throat only.

AMPHIBOLURUS RUFESCENS, *sp. nov.* Pl. VI., figs. 2 and 2*a*.

Three specimens. Mount Sir Thomas, Birksgate Range, S.A.

General Aspect.—Body proportionally short, head moderately large, snout as long as the diameter of the eye-opening. Nostrils situated below the canthus rostralis, and directed upwards, nearer the eye than the end of the snout. Upper head-scales large, strongly keeled, largest towards the snout and on the canthus rostralis, smallest on supra-orbital region, but gradually decreasing in size towards the neck. Sides of neck plicated. A low nuchal crest. Gular scales small, about half the size of the ventrals; these are very slight and obtusely keeled. Scales on sides of body small, but increasing in size towards the vertebral line. The scales on tail and upper-side of limbs are large and strongly keeled, and on the middle line of the upper-surface of the tail are intermixed with a few larger ones. Limbs and digits proportionally long, the adpressed hindlimb reaching almost to the tip of snout. Fifty-eight femoral and anal pores form on each thigh an uninterrupted line; the series of each side separated in the præ-anal region. Tail slender, tapering very gradually towards its point.

Colour.—Above, rusty-brown, with dark spots more or less regularly arranged in pairs along the vertebral line; each pair sometimes confluent. A similar single series of dark spots corresponding with the lateral line. Under-surface dirty yellowish-white; chest olive. Throat and gular region with irregularly disposed dark markings on a cream ground-colour, being most distinct in the two smaller specimens.

	Sp. A.	Sp. B.
Total length	228 mm.	210 mm.
Head	22 "	17 "
Body	66 "	47 "
Tail (injured)	140 "	146 "
Width of head	18 "	14 "
Length of forelimb ...	35 "	33 "
Length of hindlimb ...	78 "	60 "

AMPHIBOLURUS CRISTATUS, *Gray.*

Between Queen Victoria Springs and Fraser Range; one specimen.

General Aspect.—Slender. Head moderately large; snout as long as the diameter of the orbit, with subangular canthus rostralis; nostrils below the canthus rostralis, a little nearer the eye than the end of the snout; tympanum large, its width a little less than the eye-opening. Upper head-scales large, subequal, rugose and strongly keeled; they are largest towards the snout and on the canthus rostralis, smallest above the orbit. Neck long, its sides strongly plicated and spinose; nuchal crest well-developed, composed of separate compressed spines. The dorso-lateral fold with spine-like scales, which are largest on each side of the neck; a serrated ridge or crest along the back extending to about the first-third of the tail. Body much laterally compressed, covered above with small keeled scales, which are larger and most carinate on the middle of the back, and more minute on the sides; much larger isolated scales intervening. Ventral scales small, smooth or very slightly keeled. Limbs and digits very long, the adpressed hindlimb reaching beyond the tip of the snout; the length of the foot equal to the length of the rest of the forelimb; scales similar to those on the back. A series of seventy pores extending along the whole length of the thighs, uninterrupted in the præ-anal region. Tail very slender, laterally compressed, more than twice as long as head and body; caudal scales equal, keeled, a few larger ones at the base of the tail.

Colour.—Dark olive above, head and neck marked with much ochraceous-yellow. Tail with alternately dark and light annuli. Under-surface yellowish, median parts of the throat, chest and inner-surfaces of limbs black.

Total length	340 mm.
Head	22 "
Body	83 "
Tail	235 "
Width of head	20 "
Length of forelimb	40 "
Length of hindlimb	98 "

Amphibolurus scutulatus, *sp. nov.* Pl. VII., figs. 1 and 2.

Between Fraser Range and Queen Victoria Springs.

Of this species we have several specimens of each sex. At the first glance it much resembles *Amphibolurus cristatus*, but differs in the following respects:—

All the scales are much smaller, the head-scales not rugose as in *A. cristatus*, but smooth and strongly keeled. The dorsal scales are not intermixed with larger ones, but increase in size towards the vertebral line. The compressed spines of the nuchal

crest are shorter. The male specimens in this series are generally larger than the females.

Male.—Upper surface of a pale rusty-brown ground-colour, intermixed with ashen-grey, which in some specimens forms four to five indistinct transverse bands across the back for its whole length. Middle of throat, chest and under-surface of limbs black. A lanceolate black gular mark is not confluent with the black shading of the chest. On each side of the vertebral region extends a continuous lozenge-pattern marked out in pale reddish-brown, each lozenge containing darker markings in the centre. In other instances the elements of the pattern are not continuous and of a rounded shape approximating to ocelli. Neck marked with two to four fairly regular alternate bands of dark yellowish-brown, which in some specimens extend along the back, where they disappear. Sides with irregular dark-brown or black markings disposed on a ground of yellow or yellowish-brown, the dorsal ashen-grey stripes also extending into this region.

Limbs and tail dark rusty-brown, transversely crossed with indistinct paler bands. Under-surface yellowish. In *A. scutulatus* the chest marking is more elongated, and extends as far as the junction of the hindlimbs. Under-surface of the tail uniformly light-coloured. The male with fifty præ-anal and femoral pores, forming an uninterrupted series on each side, absent in the female.

Total length	325 mm.
Head	25 "
Body	75 "
Tail	225 "
Width of head	18 "
Length of forelimb	40 "
Length of hindlimb	80 "

Female.—Very similar in markings to the male, but in most specimens the chain of lozenge-shaped lateral markings is broken up into a series of light-edged ocelli; these are generally irregularly roundish or oval and often confluent; in some specimens they assume the shape of a series of figures of 8. Under-surface uniformly light-coloured, the black markings on throat and chest very faint or, on the latter, totally absent.

Total length	170 mm.
Head	20 "
Body	60 "
Tail	90 "
Width of head	—
Length of forelimb	32 "
Length of hindlimb	73 "

No femoral and anal pores.

Most of the above specimens of this very agile lizard, which lives in sandy places, were caught by the blacks, who kill them with a wooden missile called a waddy.

Amphibolurus pictus, *Peters*.

Three specimens; between Fraser Range and Southern Cross, and between Fraser Range and Victoria Springs.

Specimen A	(total length)	... ...	170 mm.
Specimen B	" "	... ...	150 "

Ground-colour of back reddish-brown; a light-coloured vertebral line from neck to root of tail; the back with black and whitish spots, which form alternate irregular cross-bars; tail whitish with irregular broad transverse bands. Under-surface cream-coloured, specimen A having the median part of the throat and chest blackish; specimen B without any markings. Sp. A with an uninterrupted series of femoral pores, which are absent in sp. B.

The third specimen, viz., that from the country between Queen Victoria Spring and Fraser Range, greatly resembles sp. B in size and colour.

Amphibolurus reticulatus, *Gray*.

Four specimens; near Queen Victoria Spring.

General aspect, stout. Head very short. Nostril piercing the canthus rostralis and directed upwards; canthus rostralis blunt. A low nuchal crest indicated by about eight or nine large conical spines. The enlarged, flat, obtusely-keeled scales which are scattered over the back are whitish and arranged in groups, three or four scales generally forming the centre of a light brownish-coloured spot; these spots are enclosed by a blackish reticulation. The specimens agree in all essential details with the description of this species given by Boulenger, but differ in possessing a smaller number of præ-anal and femoral pores, and having the ventral scales feebly keeled.

Sp. A. Total length, 115 mm.; tail injured; number of pores not ascertainable on account of bad preservation.

Sp. B. Total length, 110 mm.; twenty præ-anal and femoral pores.

Sp. C. Total length, 138 mm.; twenty præ-anal and femoral pores.

Sp. D. Total length, 135 mm.; twenty-eight præ-anal and femoral pores.

The number of pores, as stated by Boulenger, in the British Museum specimens are from thirty-five to forty-five.

Amphibolurus Adelaidensis, *Gray.*

Two specimens. Between Queen Victoria Spring and Fraser Range.

Adult.—Olive-grey above, with a regular series of dark-brown angular spots on each side of the vertebral region and another series, more or less regular, along each side between fore- and hind-limb. Head rufous, with symmetrical dark markings; limbs with irregular cross bars; tail with two longitudinal series of black spots; under-surface light-coloured, conspicuously marbled with darker tints.

Young.—Pale olive-grey above, with the same darker markings as in the adult.

The following are the measurements of the larger specimen :—

Total length	120 mm.
Head	15 "
Body	35 "
Tail	70 "
Width of head	11 "
Length of forelimb	20 "
Length of hindlimb	30 "

Amphibolurus barbatus, *Cuvier.*

This common Australian lizard was collected at the following localities :—Between the Barrow and Everard Ranges; between Everard and Fraser Ranges; between Fraser Range and Southern Cross (Yilgarn); and near the Queen Victoria Springs.

Specimens from the last-named locality are the largest, measuring 300 mm. total length. The colouring is as follows :—Of a uniform dark olive above, the smaller specimens with an ochraceous-yellow band across the head between eye and ear; in one specimen the front of the head is yellow, tail with yellow cross-bars. Under-surface light-coloured; in some specimens the throat is black.

Tympanocryptis lineatus, *Peters.*

Farina. Three specimens.

Tympanocryptis cephalus, *Günther.*

Two specimens of similar size, from outward appearance male and female; from the Murchison District, in plain-country, consisting of reddish clay soil, with scattered fragments of ferrugineous sandstone.

Nostril much nearer the eye than the tip of the snout, upper head-scales large, not so strongly keeled as in *T. lineatus;* large flat tubercles on the occiput; dorsal scales rather feebly keeled; the larger ones mucronate and forming irregular transverse

series, these give the back a wrinkled appearance. Two præanal pores. Colour rusty-brown above, with several indistinct cross-bands, the one across the neck being darkest; sides of body blackish. Tail with dark broad bars.

The following measurements refer to both specimens: –

Total length	140 mm.
Head	18 "
Body	47 "
Tail	85 "
Width of head	16 "
Length of forelimb	29 "
Length of hindlimb	40 "

PHYSIGNATHUS LONGIROSTRIS, *Boulenger.*

One specimen, Murchison District.

Total length	351 mm.
Head	26 "
Body	60 "
Tail	265 "
Width of head	13 "
Length of forelimb	32 "
Length of hindlimb	70 "

Mr. Helms informs us that he had a second specimen, about thrice the size of the above, which perished from want of preserving material.

Mr. Boulenger records Nickol and Champion Bays, N.W. Australia, as the localities where the types in the British Mus. Coll. were found.

MOLOCH HORRIDUS, *Gray.*

This lizard was collected by the Expedition at the following localities:—

Arkaringa Creek (one).
Near Everard Range (one).
Near the Barrow Range (two).
A number of ova (laid in confinement) Fraser Range.

Family VARANIDÆ.

VARANUS GOULDII, *Gray.*

Two specimens; Fraser Range.

Dark brown above, with yellow annuli which form about fourteen rows across the back and sides of the body; yellow bars across limbs, toes and tail, those on the limbs interrupted; temple with two yellow streaks separated by a black band, these streaks extend distinctly along the sides of the neck. Lower surface yellowish, with small blackish spots. Throat with an angular

lambdoid blackish mark. Lower jaw light-coloured. The terminal third of the tail is light-coloured, without any markings.

The second specimen is smaller, and has rows of round yellow spots across the limbs. The length of the neck (13 cm.) given in Boulenger's description seems to be disproportionate to the length of the head (8 cm.). Possibly his measurements were taken from skins or mounted specimens, as we have found a similar discrepancy in our stuffed specimens as compared with those in a fresh state or preserved in spirits, of which we have measured a large number.

Total length	41·5	centim.
Head	5	"
Neck	5	"
Body	19	"
Tail	48	"
Length of forelimb	7·5	"
Length of hindlimb	12	"

VARANUS PUNCTATUS, *Gray*.

One male specimen; Fraser Range.

The length of the neck nearly equal to the length of the head. A tuft of spines on each side of the base of the tail. Above, nearly black, with narrow yellowish reticulated lines on the trunk, which gradually disappear towards the neck, but these are most distinct towards the root of the tail. Limbs minutely punctated with yellow; root of tail with a few narrow yellowish annuli. Under-surface greyish, mottled with yellow and black. Throat, chest and under-surface of tail uniformly black.

Total length	71·5	centim.
Head	5	"
Neck	4·5	"
Body	18	"
Tail	44	"
Length of forelimb	7	"
Length of hindlimb	9·9	"

Family SCINCIDÆ.

EGERNIA WHITEI, *Lacép*.

One specimen. Between Fraser Range and Queen Victoria Spring.

Above, olive-brown with two black dorsal bands, each of them with a series of small whitish spots; sides of body salmon-coloured. Under-surface pale, with olive tinge; throat partly bluish, with black markings. Total length, 200 mm.

EGERNIA KINTOREI, *sp. nov.*

One very large specimen of this beautiful lizard is from the northern part of the Victoria Desert, south of Barrow Range a second small immature specimen from the Fraser Range and a third, also a young one, from between the Fraser Range and the Queen Victoria Spring.

A full description of this new species, which we have named in honour of His Excellency the Governor, the Earl of Kintore, will be given in a detailed report upon the zoological results of His Excellency's transcontinental journey, on which occasion it was first found by Dr. Stirling. Largest specimen :—

Total length	360 mm.
Head	35 "
Body	150 "
Tail	175 "
Width of head	30 "
Length of forelimb	55 "
Length of hindlimb	60 "

In the largest specimen the colour is a light reddish-brown above, with dark markings; under-surface bright lemon-coloured; but the latter tint has now faded from immersion in spirit. This specimen was found in the possession of a young black girl, who was left behind by the tribe on the approach of the Expedition. The two smaller specimens have a total length respectively of 145 and 160 mm.

EGERNIA DEPRESSA, *Günther.*

One male and two females of this apparently little-known lizard were obtained in the Murchison River District, having been found in hollow logs. One of the females contained a fully developed young of about 50 mm. total length in each oviduct. All these specimens accord with Boulenger's description. Colour olive-brown above, with irregular cross bands ; those on the neck are reddish-brown, on the tail black, edged with light yellow. Measurements of largest specimen :—

Total length	130 mm.
Head	23 "
Body	67 "
Tail	40 "
Width of head	17 "
Length of forelimb	25 "
Length of hindlimb	30 "

EGERNIA STRIOLATA, *Peters.*

Two specimens ; between Fraser Range and Southern Cross.

These agree in all essential respects with the description given in Boulenger's Catalogue.

The number of labials are respectively seven and eight in the two specimens; one has the fourth, the other the fifth right upper labial shield subdivided. Thirty-two scales round the middle of the body; dorsals largest, tri- or quadri-carinate (not quinquecarinate, as stated to be the case in the British Museum specimens). Total length, 170 mm. (the tail having been reproduced). Above, dark slate-coloured, with the neck rufous, tail olive. Some of the dorsal scales have a dark central spot. Under-surface salmon coloured, throat bluish.

Trachysaurus rugosus, *Gray*.

Four specimens; between Fraser Range and Hampton Plains. The largest specimen 340 mm., total length. Above jet-black, marked with a few bright sulphur-yellow and brick-red spots on the back and limbs. Head, with the exception of the parietals, bright brick-red. Under-surface black, with large yellow spots.

Tiliqua occipitalis, *Peters*.

Three specimens, Fraser Range; the largest 400 mm., total length.

Lygosoma Leæ, *Boul*.

One specimen from the Barrow Range. This differs somewhat from Boulenger's description, but from a single specimen, and in the absence of comparison with the type-specimen, we cannot positively state whether it is referable to this species or not. The differential characters are 24 scales round body, no præ-anal pores present, and instead of the six white longitudinal lines on the back in the British Museum type-specimen, our specimen has eight lines of a greenish tinge.

Total length	160 mm.
Head	15 "
Body	42 "
Tail	103 "
Width of head	8 "
Length of forelimb	16 "
Length of hindlimb	30 "

Lygosoma Fisheri, *Boul*.

Seven specimens; Barrow and Everard Ranges.

At the first glance these closely resemble the common variety of *Lygosoma Lesuerii*. The white edges of the black dorsal bands are wide, and the row of small light spots on each side of the dorsal line, which are usually present in *Lygosoma Fisheri*, are, in the above specimens, totally absent. Five upper anterior labials, the sixth being below the eye.

Two young ones, obtained between the Everard and Barrow

Ranges, have these spots fused, forming two additional pale narrow longitudinal lines on each side of the back.

Total length	200 mm.
Head	15 "
Body	62 "
Tail	123 "
Width of head	18 "
Length of forelimb	18 "
Length of hindlimb	33 "

LYGOSOMA MONOTROPIS, *Boul.*

One specimen; found in a dry well at Yardanie, between Fraser Range and Yilgarn.

Light-brown above, with nine dark-brown, broad, transverse bands between the head and base of tail; the latter having nine bands, but the reproduced portion is not banded. The interparietal shield presents a very marked external indication of a pineal eye appearing as a white spot.

Total length	160 mm.
Head	23 "
Body	60 "
Tail	77 "
Width of head	12 "
Length of forelimb	23 "
Length of hindlimb	32 "

LYGOSOMA MELANOPS, *spec. nov.* Pl. VI., figs. 3 and 3*a*.

Two specimens; between the Everard and Barrow Ranges.

This species is closely allied to *Lygosoma branchiale*, with which it agrees in many respects, but the distance between the end of the snout and the forelimb is contained nearly twice and a-half times in the distance between the axilla and groin instead of once and three-fourths to twice as in *L. branchiale*. Body much elongate. The three large vertical spots on each side of the neck in *L. branchiale* are absent.

Colour.—Olive above; rows of black dots descend from the sides of the head to the throat; alternate scales of the trunk marked with a black spot or short streak; on the neck-scales the spots are absent, on the tail they are sometimes double. Under-surface pale straw-coloured, with the scales similarly spotted.

Young, like the adult, but every third or fourth shield having a large white spot. Face, upper and lower lips blackish, but not so dark as in the adult.

Total length	153 mm.
Head	17 "
Body	70 "
Tail	66 "
Width of head	10 "
Length of forelimb	16 "
Length of hindlimb	20 "

Lygosoma fragile, *Günther.*

Two specimens ; between the Everard and Barrow Ranges.

In the following notes we repeat Boulenger's description, which agrees accurately with the above specimens :—

Body much elongate ; limbs very weak, tridactyle. Scaling as in *L. Bougainvillei*, except that the fronto-parietals are united into a single shield, and the fourth labial enters the orbit. Ear just distinguishable. Twenty scales round the body. Hind-limb as long as the distance between the eye and forelimb. Toes very unequal in size, the third longest.

Colour.—Olive above, with indistinct black lines along the series of scales ; sides blackish, this colour being sharply defined towards the back ; belly sparingly spotted with black.

The following are the measurements of one specimen :—

Total length	74 mm.
Head	6 "
Body	33 "
Tail	35 "
Width of head	4 "
Length of forelimb	4 "
Length of hindlimb	9 "

Lygosoma Gerrardii, *Günther.*

One specimen ; Fraser Range.

Colour.—Light-grey above, with four narrow dark-brown longitudinal lines. Lateral lines broad, and of the same colour ; lower surface yellowish.

Total length, 150 mm.

A species of Lygosoma, represented by three specimens, collected in the Barrow Range, agrees in every respect with *L. Gerrardii*, except that the forelimbs are didactyle, and the hindlimbs tridactyle. There are, in the S.A. Museum, several lizards which we refer to *L. Gerrardii*, with the forelimbs rudimentary or altogether invisible externally. We come therefore to the conclusion that the number of toes in this group, which formerly formed the genus *Rhodona*, are subject to great variation. Boulenger stated, in describing this species, that the forelimbs are either mono- or di-dactyle.

Lygosoma bipes, *Fisher.*

A single specimen of this little lizard, which appears to be scarce in collections, was obtained in the Barrow Range. It agrees exactly with the description in the "British Museum Catalogue."

Total length	97 mm.
Head	5 "
Body	47 "
Tail	45 "
Width of head	3 "
Length of hindlimb	10 "

Ablephorus Greyi, *Gray.*

A single specimen ; near Camp 9 (Everard Range).

Order Ophidia.

Typhlops sp.—A small specimen of a species of *Typhlops* was collected in the Fraser Ranges, the specific name of which we are not yet in a position to determine.

Pseudechys australis.

Between the Fraser Range and Yilgarn ; two skins in spirit, each about six feet long.

Vermicella fasciata, *spec. nov.* Pl. VI., figs. 4 and 4*a*.

Near the Barrow Range ; one specimen.

Scales in seventeen rows ; abdominal plates 145–146 ; two anal plates ; subcaudal plates in two rows of twenty-seven each. Body of moderate length (12·5 inch), nearly cylindrical ; the tail short (1⅓ inch), terminating in a blunt conical scale. Head very short (0·30 inch long), not distinct from trunk. Rostral shield large, obtusely angular posteriorly ; nostrils elongate, piercing the middle of a rhomboidal nasal shield. Anterior frontals quadrangular, forming sutures with the nasals on the outer margin ; posterior frontals hexagonal, also forming sutures with the nasals as well as with the second and third labial shields ; vertical shield hexagonal, nearly as broad as long, very obtusely angular anteriorly and nearly rectangular posteriorly. Supra-oculars large, pentagonal anteriorly ; one anterior and two posterior oculars. Occipital shields large, pentagonal or hexagonal, broader in front than behind. Three temporal shields, of which the first is the largest and is in contact with the posterior oculars, and also with the fifth and sixth labials. Six upper labials, the third and fourth reaching the margin of the eye, the last the largest. Seven lower labials, the first elongate and forming a long suture behind the triangular mental shield ; the second small, and the fourth the largest.

Colour.—Head cream-coloured ; rostral, anterior and posterior frontals marked with black on their posterior margin. Upper lip-shields similarly marked on their superior margin ; all the remaining shields of the upper surface of head black. Upper surface very conspicuously marked with 53 black transverse bands, which comprise one row of scales and occupy about one-half the circumference of the body. The spaces between these bands occupy two transverse rows of scales, and present a distinctly orange tinge from the fact that each scale, cream-coloured at its base, is tipped with the former colour. The scales of the the black bands have a pale spot or streak in the centre for the posterior three-quarters of the body. Under-surface uniformly cream-coloured.

This very distinct species resembles *V. Bertholdi* in external appearance, but is proportionally much more elongate, and the black freckles on the head, which are characteristic for the latter species are totally absent in *V. fasciata.* A second specimen in the South Australian Museum conforms to the above description, but the markings have become faded from exposure to light. It was collected in the Western plains.

AMPHIBIA.

Order Batrachia.

Family BUFONIDÆ.

Pseudophryne australis, *Günther.*

Found about forty miles N.W. of the Fraser Range in a rock-hole filled up with silt ; seven specimens.

These specimens closely resemble the above-named species, but show slight differences in respect of having the metatarsal tubercles much larger, and a greater predominance of light-colour on the under-surface.

DESCRIPTIONS OF PLATES.

Plates VI.

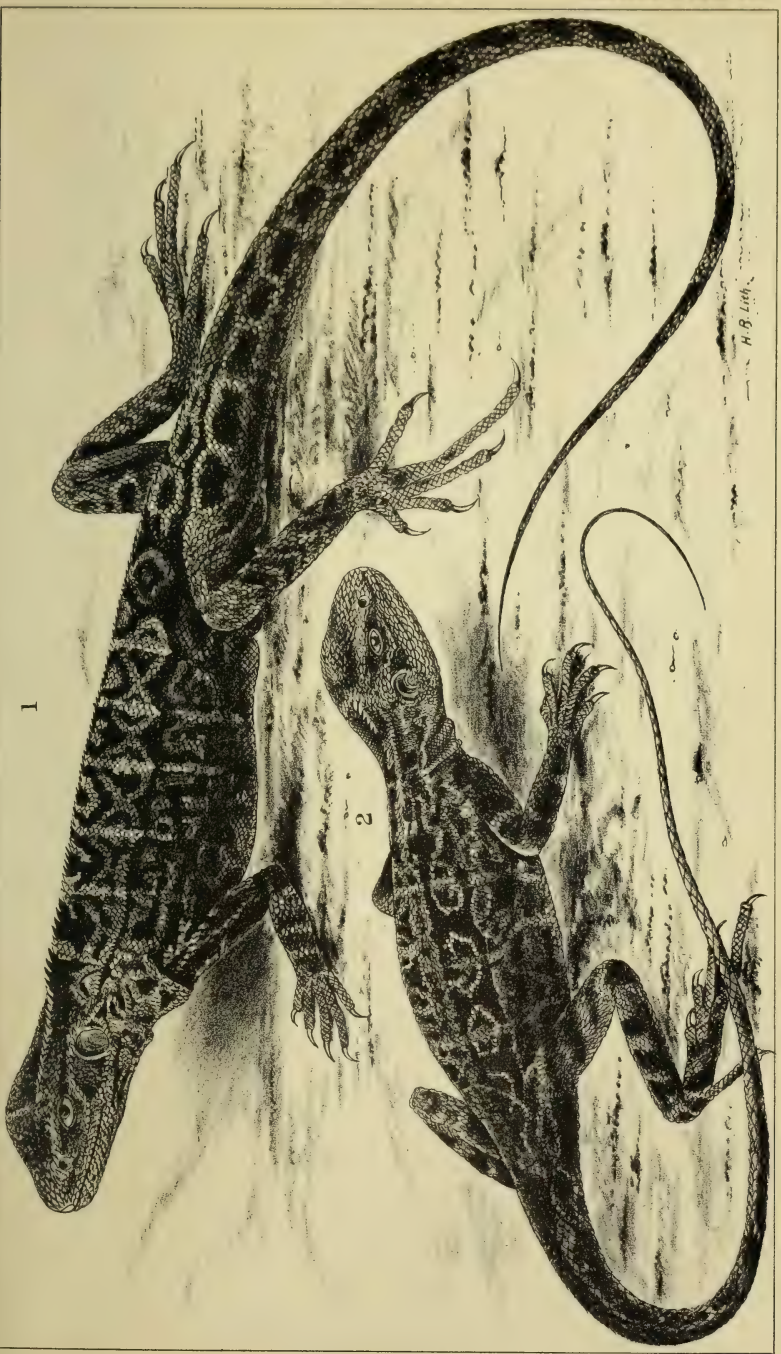
Fig. 1. Diplodactylus Elderi. *Nat. size.*
" 1*a*. " " Scales of back ; *enlarged.*
" 2. Amphibolurus rufescens. Upper surface of body ; *nat. size.*
" 2*a*. " " Dorsal scales ; *enlarged.*
" 3. Lygosoma melanops. *Nat. size.*
" 3*a*. " " Head shields ; *nat. size.*
" 4. Vermicella fasciata. *Nat. size.*
" 4*a*. " " Head shields ; *nat. size.*

Plate VII.

Amphibolurus scutulatus. Fig. 1. Male. Fig. 2. Female.

H.B. lith.

Hussey & Gillingham Lith.



Hussey & Gillingham Lith.

COLEOPTERA

(Continued).

By REV. T. BLACKBURN, B.A.,

Hon. Curator for Entomology, S. Aust. Mus.

In the former part of this memoir I furnished a catalogue in systematic order of the *Coleoptera* of the Elder Expedition down to the Tribe *Leptopsini* of the Family *Curculionidæ*, one tribe, however, of the *Carabidæ* (the *Broscides)* being omitted, owing to my having asked Mr. T. G. Sloane, of the Linnean Society of N.S. Wales, to deal with it. Mr. Sloane has made a special study of that tribe, and has published some valuable memoirs relating to it, so that it is a matter for congratulation that the Royal Society has been able to enjoy the benefit of his assistance. His contribution on the *Broscides* will be found in the present issue. I now propose to continue and complete the catalogue of the *Coleoptera* of the Expedition, taking up the work at the place where the former part ended. The first of the remaining tribes of *Curculionidæ* (the *Amycterini)* is, however, another group of which Mr. Sloane has made a special study, and that gentleman has been good enough to take them in hand, his memoir relating to them finding a place in this issue.

The first species enumerated in the following catalogue *(Evaniocera minuta)* belongs, it will be observed, to a family (the *Rhipidophoridæ)* whose proper place is in the part issued last December. Its omission was due to the specimen having been so clogged with gum that its characters were not visible, and I accidentally passed it over, under the impression that it was a Phytophagous insect, but as soon as I had cleaned it for examination its real place was of course apparent.

It will be noticed that I have introduced in the catalogue of species obtained by the Elder Expedition descriptions of several species in my own collection. These are insects allied to some of those of the Expedition, and inhabiting localities (such as the McDonnell Ranges, the basin of Lake Eyre, the Eyre-Peninsula) that may be regarded as outlying parts of the geographical region through which the expedition travelled. It seems convenient that their descriptions should appear in company with those of their allies which fell into the hands of Mr. Helms. The interpolated species are indicated by an asterisk prefixed to the name.

RHIPIDOPHORIDÆ.

EVANIOCERA.

E. minuta, sp, nov. Sat nitida; picea, tibiis paullo dilutioribus, elytris pallide marginatis; pubescens; capite prothoraceque sat fortiter granulatis; hoc a basi ad apicem angustato, lateribus fere rectis, angulis posticis extrorsum (nullo modo retrorsum) directis, basi media sat fortiter lobata; scutello oblongo-quadrato, postice rotundato; elytris minus fortiter granuloso-punctulatis, oblique obsolete striatis. Long., $1\frac{4}{5}$ l.; lat., $\frac{4}{5}$ l.

Maris antennarum articulo 3° quam 2^us^ duplo longiori et ramum quam sequentium parum breviorem emittenti.

At once distinguishable from the previously described Australian species of this genus by its extremely small size.

Everard Range.

CURCULIONIDÆ (continued).

CYLINDRORHININI.

PANTOPŒUS.

An immature and somewhat crushed specimen seems to appertain to this genus, but its condition forbids its specific determination. It was found about the Barrow Range.

GONIPTERINI.

OXYOPS.

O. pruinosus, Pasc? Mr. Pascoe's description is too brief to allow of positive identification, but the example before me seems likely to be the insect to which this name was given, at any rate it is very near it.

Mount Squires.

O. floreus, Pasc? A similar difficulty forbids my feeling certain that this identification is correct.

Fraser Range.

SYARBIS.

S. gonipteroides, Pascoe. Mount Squires.

S. sciurus, Pascoe. Mount Squires.

ATERPINI.

APARETE.

In dealing with genera characterised by Mr. Pascoe, the precaution generally seems necessary of qualifying one's reference to them of new species. In the present case *Aparete* seems to me very much over characterised, even the relative length of the joints of the funiculus being treated as generic. In this and

other minutiæ the following species does not agree with the diagnosis, but it presents the following characters, which I take to be the essential features distinguishing *Aparete* from the other *Aterpid* genera:—Ocular lobes wanting; body not cylindric; scrobes terminal or nearly so; club of antennæ closely united to the funiculus; tarsi having their penultimate joint entire.

A. nodosa, sp. nov. Sat convexa; fusco-cinerea, squamis crassis (setulisque brevibus) cinereis vestita; rostro sat brevi supra longitudinaliter concavo; capite utrinque supra oculos cristato; prothorace quam latiori sublongiori, pone apicem subfoveatim depresso, vermiculato-ruguloso, postice subtruncato, antice paullo angustato in medio sat producto, lateribus sat rotundatis; elytris punctulato-striatis, interstitiis convexis, interstitiis 3° 5° que pone medium (hoc 3— illo 2—) 7° ad humerum (hoc 1—) tuberculatis; corpore subtus sparsim fortiter punctulato. Long., $3\frac{1}{5}$—$4\frac{1}{2}$ l.; lat., $1\frac{3}{5}$—2 l.

The basal two joints of the antennal funicle are elongate, the rest transverse or nearly so, the seventh being considerably enlarged and somewhat confused with the club. The metasternum is a little shorter than in *Ethemaia sellata*, Pasc. This species differs *inter alia* from *A. palpebrosa*, Pasc., by the second joint of its funicle not transverse.

Nilpena, and to the west of that place; also Cootinoorina.

HYPHÆRIA.

This genus is very briefly characterised by its author (Mr. Pascoe), who says that the characters are as in *Ethemaia*, but the third tarsal joint not bilobed. The following species do not appear to differ from *Ethemaia*, except by the character specified.

**H. beltanensis*, sp. nov. Minus convexa; nigra vel fusca, setis brevibus squamisque adpressis colore variis (fuscis nigris et albidis) vestita; rostro sat brevi supra longitudinaliter concavo, utrinque cristis 2 instructo; capite utrinque supra oculos cristato; prothorace vix quam latiori longiori, antice leviter angustato, late leviter canaliculato, coriaceo, valde inæquali, margine antico antrorsum postico retrorsum convexis, lateribus leviter arcuatis; elytris confertim subtiliter punctulatis, leviter striatis (striis puncturis magnis seriatis instructis), interstitiis minus (alternis paullo magis) convexis; interstitio 3° tuberculo magno, 5° tuberculis 3, postice ornatis; corpore subtus confertim rugulose reticulato-punctulato. Long., 3—$3\frac{4}{5}$ l.; lat., $1\frac{2}{5}$—$1\frac{3}{5}$ l.

This is an extremely difficult species to describe satisfactorily; probably it may be best distinguished by its generic characters

and its remarkable head and rostrum. These latter form together an uninterrupted longitudinally concave surface, with a very large crest over each eye, a smaller one on each side of the rostrum near its base, and a still smaller one on each side near the apex of the rostrum. Most of the specimens I have seen are covered with a brown indumentum, which completely hides all the sculpture except the crests of the head and rostrum and the tubercles near the apex of the elytra; also the whole sculpture of the under-surface. I have described the sculpture from an example from which I have with much difficulty removed the indumentum. The only specimen I have seen without the indumentum is a decidedly pretty insect, closely covered with scales and setæ, which almost conceal the sculpture. In that example the crests of the head and rostrum are tipped with bright brown setæ, the prothorax is traversed longitudinally by four ribs of brown scales and is variegated with whitish scales on the sides, the interstices of the elytra form alternate brown and blackish vittæ, and patches of whitish scales are distributed over the elytra, the most conspicuous being a spot running obliquely hindward towards the suture from the anterior part of the seventh interstice. The legs are thickly clothed with brown scales and hairs.

S. Australia; near Beltana.

**H. parallela*, sp. nov. Elongata; parallela; fusca, squamis setisque fuscis cinereisque intermixtis vestita; rostro minus brevi longitudinaliter concavo, capite utrinque supra oculos obsolete cristato; prothorace cylindrico quam latiori sat longiori, grosse ruguloso-punctulato; elytris punctulato-striatis, interstitiis alternis convexis (3° toto et 5° postice tuberculis remotis ornatis, tuberculis discoidalibus nigris). Long., $2\frac{2}{5}$ l.; lat., $\frac{7}{10}$ l.

This species must be referred to *Hyphœria*, as I can find no structural character to distinguish it from *Ethemaia*, except that the third joint of its tarsi is not bilobed. It is very distinct from all its previously-described allies by its very narrow and parallel—almost linear—form. The crest on either side of the head is very feeble. The antennæ are short, not reaching back much behind the front of the prothorax; the basal joint of the funiculus is not much longer than wide, and is much thicker than the following joints, which are moniliform and clothed with fine hairs. The prothorax is almost perfectly cylindric, its front margin a little elevated; the ashy scales on its surface are sprinkled over the surface, but are condensed to form three vittæ. The prevalent scales on the elytra are the cinereous ones; a small black tubercle on the third interstice in front of the middle is accompanied by a similar elevation close to it on the

fourth interstice slightly nearer the front, and the black colour runs across the stria so that there is an appearance of a small obliquely-elongate black patch ; the third interstice bears another small black tubercle or crest a little behind the middle, and another at the posterior declivity and two very small ones near the apex. The hinder part of the fifth interstice bears some obscure tubercles.

Central Australia ; McDonnell Range.

**H. variabilis*, sp. nov. Minus elongata ; fusca vel nigra, squamis setisque nigris fuscisque intermixtis vestita ; *H. parallelæ* affinis ; differt forma multo minus gracili minus parallela, prothorace minus elongato ad latera magis rotundato, elytris haud ante medium tuberculatis. Long., $2\frac{1}{5}$—$3\frac{1}{5}$ l. ; lat., $\frac{4}{5}$—$1\frac{1}{5}$ l.

This is a most variable insect, and extremely difficult to characterise satisfactorily owing to most specimens being more or less clothed with an indumentum, which conceals the characters. A fresh specimen is clothed with dull-brown scales, with usually some indication on the prothorax of vittæ formed by paler scales ; on the elytra there are usually patches of black scales, which vary in extent up to almost covering the surface. The alternate interstices are convex, and the tubercles are confined to the posterior declivity, commencing, however, slightly in front of it ; the third and fifth interstices each bear two well-defined tubercles, and there are a few more or less defined granule-like tubercles.

S. Australia ; basin of Lake Eyre.

Belini.

Belus.

B. angustulus, Germar. Fraser Range.

B. sparsus, Germar. Fraser Range.

B. difficilis, sp. nov. Angustus, sublinearis ; piceus, squamis albidis ornatus, prothorace antice elytris pedibusque rufescentibus ; rostro valido cylindrico arcuato quam prothorax subbreviori nitido subtilissime punctulato ; capite prothoraceque confertim granulatis ; antennarum articulis 3° 4° que longitudine inter se æqualibus ; prothorace quam latiori vix longiori, vix canaliculato, in medio longitudinaliter albido-squamoso, lateribus leviter arcuatis antice subcoarctatis, basi bisinuata ; elytris confertim sat subtiliter punctulatis suturam versus maculatim albido-squamosis, ad apicem singulatim acuminatis vix productis, juxta scutellum subelevatis ; abdomine in medio sparsim, ad latera dense albo-hirto ; femoribus

anticis muticis fortiter incrassatis, posticis segmenti ventralis basalis apicem haud attingentibus. Long (rostr. incl.), 5 l.; lat., 1 l.

Closely allied to *B. angustulus*, Germ., and *filiformis*, Germ., differing from the former *inter alia* by its shorter and stouter rostrum, its more linear form and the much less produced apices of its elytra; from the latter *inter alia* by its elytra distinctly mottled with whitish scales near the suture, its less elongate form and the more produced apices of its elytra.

Fraser Range.

B. Helmsi, sp. nov. (fem.). Minus angustus; niger, squamis niveis ornatus, rostro antice et antennarum basi summa paullo rufescentibus; rostro cylindrico leviter arcuato quam prothorax paullo longiori, nitido, sat crebre a basi antrorsum gradatim magis subtiliter punctulato; capite mox intra oculos niveo-squamoso, sat crasse punctulato-granuloso; prothorace valde crasse nec crebre ruguloso-granulato (magis crasse minus crebre quam *B. bidentati*, Don.), quam longiori sat latiori, in medio canaliculato, niveo-trivittato, lateribus fortiter rotundatis, latitudine majori pone medium posita, basi media fortiter lobata; elytris ad basin fortiter (quam *B. bidentati* multo magis fortiter) singulatim lobatis, ad apicem singulatim acuminato-productis (quam *B. hemisticti*, Germ., paullo minus fortiter), antice fortiter granulosis postice fortiter vix crebre (quam *B. hemisticti*, Germ., paullo minus crasse minus crebre) punctulatis, longitudinaliter leviter bisulcatis (parte intermedia leviter convexis), maculatim niveo-squamosis, maculis antice confusis postice subtriseriatim ordinatis; abdomine ad latera dense, in medio confuse maculatim niveo-hirto; femoribus anticis muticis posticis segmenti ventralis secundi partem mediam attingentibus. Long. (rostr. incl.), 7 l.; lat., $1\frac{2}{5}$ l.

Allied to *B. semipunctatus*, Fab., and *hemistictus*, Germ., differing from both *inter alia* by its mutic femora, and the absence of any trace of an elytral carina; also near *B. amplicollis*, Jekel, but differing by its black antennæ and tibiæ; also (perhaps) near *B. anguineus*, Pasc. (which is insufficiently described), but differing from the description by its decidedly transverse prothorax. The elytra are not at all elevated at the base of the scutellum. The third joint of the antennæ is distinctly longer than the fourth.

Fraser Range.

B. ventralis, sp. nov. Elongatus, sat angustatus, sat parallelus; niger, squamis niveis ornatus, pedibus elytrisque nonnihil rufescentibus; rostro cylindrico leviter arcuato quam pro-

thorax sat longiori subtiliter sat crebre punctulato; capite inter oculos trivittatim niveo-squamoso, granuloso; prothorace sat fortiter nec crebre (quam *B. bidentati* manifeste minus crebre) granuloso, quam latiori fere longiori, in medio leviter canaliculato et interrupte niveo-squamoso, in disco utrinque maculis nonnullis niveis ornato, lateribus leviter arcuatis, basi fortiter bisinuata; elytris ad basin sat fortiter (fere ut *B. bidentati*, Don.) singulatim lobatis, ad apicem singulatim acuminato-productis (quam *B. hemisticti*, Germ., vix minus fortiter), sat fortiter sat crebre (fere ut *B. scalaris*, Germ.) granuloso-punctulatis, fere ut præcedentis *(B. Helmsi)* squamis niveis ornatis; abdomine ad latera dense niveo-hirto in segmentorum singulorum medio maculis singulis trifidis (ut *B. scalaris*, Germ.) niveo-hirtis ornato, femoribus anticis muticis, posticis segmenti ventralis basalis apicem vix attingentibus. Long., 8 l.; lat., $1\frac{3}{10}$ l.

Very close to *B. scalaris*, Germ., but certainly not, I think, a *mere* variety. It differs in the much more nitid and less conspicuously punctulate rostrum, in the prothorax longer and less rounded laterally (in the same sex), and especially in the white pilosity on the elytra not being confined to the sutural region, but forming three rows of spots on each elytron, with other spots added in the basal part. If it should prove to be a variety of *scalaris* the very different markings of the elytra would justify its being a *named* variety. It is not quite so narrow and elongate as *B. scalaris*.

Fraser Range.

B. frater, sp. nov. Sat elongatus; sat angustus; niger, squamis niveis ornatus, rostro elytris pedibusque plus minusve rufescentibus; rostro cylindrico leviter arcuato quam prothorax paullo longiori, subtiliter (maris) vel subtilissime (feminæ) punctulato; capite mox intra oculos niveo-squamoso, ut prothorax crebre nec crasse granuloso; prothorax leviter transverso, sat late canaliculato (canali dense niveo-squamoso), lateribus postice sat rotundatis, basi fortiter bisinuata; elytris ut præcedentis *(B. ventralis)* sed pone scutellum leviter gibbosis, plus minusve (omnium exemplorum sutura dense) crebre maculis niveis squamosis ornatis; abdomen fere ut *B. ventralis;* femoribus anticis subtus ante apicem bidentatis, posticis segmenti ventralis basalis apicem vix attingentibus. Long. (rost. incl.), 6—8 l.; lat., 1—$1\frac{2}{5}$ l.

In the male the rostrum is more strongly punctured than in the female, and the anterior femora are much less incrassate. This species is so close to the preceding that if I had not seen both sexes of it I should have hesitated to distinguish it specific-

ally. It, however, differs in its femora dentate beneath, its more slender rostrum, its prothorax wider with more rounded sides and closer sculpture , its elytra slightly protuberant behind the scutellum, its less linear form, and its abdomen with the pilosity of the middle part (though forming a similar pattern) much less dense and conspicuous (this is not owing to abrasion). The fourth joint of the antennæ is scarcely longer than the third. In some examples the pilosity along the suture scarcely consists of spots, but is continuous.

Fraser Range.

**B. bison*, sp. nov. *B. Helmsi* affinis; rostri apice et antennarum basi haud rufescentibus; capite prothoraceque sat crebre vix crasse (fere ut *B. bidentati*, Don.) granulosis; prothoracis canali vix perspicue niveo-squamoso ; elytris pone scutellum fortiter abrupte elevatis, ad basin quam *B. Helmsi* minus (quam *B. bidentati* magis) fortiter lobatis, postice quam *B. hemisticti*, Germ., vix minus crebre punctulatis, sulco exteriore vix manifesto ; femoribus posticis segmenti ventralis basalis apicem parum superantibus; metasterni episternis macula magna denudata instructis; cetera ut *B. Helmsi*. Long. (rostr. incl.), $6\frac{1}{2}$—$7\frac{4}{5}$ l.; lat., $1\frac{2}{5}$—$1\frac{4}{5}$ l.

This species is remarkably like *B. Helmsi*, but is at once distinguishable from it by the strongly-defined hump behind its scutellum, by the notably closer and less-coarse sculpture of its head and prothorax, by its prothoracic channel almost devoid of pilosity (apparently not the result of abrasion), by the very evidently closer puncturation of its elytra, by the longitudinal concave spaces on the elytra being very feeble (the outer one scarcely traceable), by the third joint of the antennæ being not at all longer than the fourth, by the presence of a large round denuded spot on the episterna of the metasternum—that part being in *B. Helmsi* (as in most *Beli*) covered uniformly with the pilosity of the lateral stripe—and by its shorter hind femora.

The male is a little smaller and narrower than the female, its rostrum scarcely different from that of the female, its elytra a little less produced posteriorly, and (as usual in the genus) its anterior femora much less incrassate.

Interior of S. Australia ; basin of Lake Eyre ; in my collection

**B. perplexus*, sp. nov. (Mas.) *B. Helmsi* affinis ; rostri apice vix antennarum basi nullo modo rufescentibus ; prothorace magis crebre minus crasse (fere ut *B. bidentati*, Don.) ruguloso-granuloso, canali vix perspicue niveo squamoso, lateribus ab apice fere ad basin subrecte divergentibus (ut *B. bidentati*, Don. maris), basi media minus fortiter lobata ; elytris ad basin minus fortiter (quam *B. bidentati* manifeste minus

fortiter) lobatis, distincte tricarinatis, carinis antice et postice obsoletis. Long. (rostr. incl.), 6 l. ; lat., $1\frac{3}{10}$ l.

Sterni episternis maculis denudatis binis ornatis, cetera ut *B. Helmsi*.

This insect is extremely close to *B. Helmsi* and *B. bison*, but is certainly a good species. From *B. Helmsi* it is at once distinguishable by the base of the elytra being very much less strongly lobed forward and the third and fourth joints of its antennæ being equal or nearly so ; from *bison* by the absence of any elytral protuberance behind the scutellum, and from both by the three well-defined carinæ on each of its elytra. These carinæ terminate at the point where the elytra begin to narrow to the apex ; that nearest the suture begins at a distance from the base about equal to a quarter of the length of the elytra, and the others at successively increasing distances from the base ; the intervals between them are not distinctly concave, but there is a wide flat space on either side of the suture limited by the first of the carinæ. The innermost carina on each elytron is almost exactly like the corresponding carina on the elytra of *B. bidentatus*, but is more distant from the suture. The prothorax of almost exactly the same shape (but a little less transverse), at any rate in the male, as that of *B. bidentatus* is a good character.

I have examples from Western Australia of a *Belus* which I cannot separate from this by any definite character, although it has a very different appearance owing to the squamosity of its surface being grey rather than white, and being very much more plentiful, almost covering the surface.

Interior of S. Australia ; basin of Lake Eyre.

**B. Flindersi*, sp. nov. (Mas.) *B. Helmsi* affinis ; piceo-niger, rostro antennis pedibusque paullo rufescentibus ; prothorace minus crasse magis concinne granulato (fere ut *B. scalaris*, Germ., sed granulis nonnihil majoribus), quam longiori fere tertia parte latiori, canali mediano albo-squamoso nisi ad basin carente, basi media minus fortiter lobata ; elytris ad basin paullo minus fortiter lobatis, antice magis crebre magis subtiliter granulosis postice magis crebre punctulatis ; abdomine toto et metasterno maculis denudatis ornatis nec ad latera vitta pilosa continua instructis ; femoribus anticis dentibus binis parvis armatis, posticis segmenti ventralis basalis apicem vix superantibus ; cetera ut *B. Helmsi*. Long. (rostr. incl.), $6\frac{1}{2}$ l.; lat., $1\frac{2}{3}$ l.

The greatest width is immediately behind the base of the elytra, whence the outline is slightly incurved, the width near the apex being not much less than in front ; in the species of *Belus* having an outline of this kind the posterior dilatation is

usually greater than that behind the base. The typical example is distinguished from its nearest allies by the distinctly reddish tone of the elytra and legs, and by the paucity of its whitish scales, which form small spots placed at long intervals along the suture, and a few not very conspicuous spots sparsely sprinkled over the rest of the surface; but it is quite possible that these characters of colour and vestiture are not constant. The whole of the under-surface being mottled with denuded spots, so that there is no continuous white stripe, is likely to be a reliable character. The third and fourth joints of the antennæ are almost equal in length.

South Australia; Eyre's Peninsula.

**B. mundus*, sp. nov. Sat angustus; parallelus; piceo-niger, squamis niveis ornatus, antennis pedibusque paullo rufescentibus; rostro cylindrico quam prothorax vix longiori, pone antennarum basin ut capite prothoraceque opaco sat crebre granuloso-ruguloso, antice nitido fere lævigato; antennis sat brevibus, articulis 3° 4° que longitudine inter se sat æqualibus; capite mox intra oculos niveo-squamoso; prothorace leviter transverso, canaliculato, canali niveo-squamoso; lateribus a basi fere ad apicem fortiter rotundatis, basi fortiter bisinuata; elytris ad basin sat fortiter (fere ut *B. scalaris*, Germ.) lobatis, ad apicem singulatim rotundatis haud productis, sat crebre (quam *B. scalaris*, paullo minus fortiter) rugulosis, maculatim niveo-squamosis, maculis juxta suturam majoribus magis crebris; corpore subtus ad latera dense in parte mediana minus dense niveo-piloso, hac maculatim subdenudata; femoribus anticis subtus sat fortiter bidentatis, posticis segmenti ventralis basalis apicem vix superantibus. Long. (rostr. incl.), $5\frac{1}{5}$ l.; lat., 1 l.

This is a very cylindric and parallel species, but not extremely slender or narrow, its shape being very much as in *B. scalaris*, Germ., albeit not quite so elongate. Its elytra scarcely at all produced (much less than in *B. scalaris*, though evidently more so than in *B. brunneus*, Guér.) at the apex, together with the presence of strong teeth beneath each of its front femora, associates it with a small group of species from all of which it is very distinct—by the following among other characters:—from *B. aphthosus*, Pasc., by its transverse prothorax, from *brunneus* by the character already mentioned, from *serpens*, Pasc., by there being two teeth (not only one) beneath its front femora. One or two others of Mr. Pascoe's briefly-described species may possibly belong to the same group, as their author does not say whether the femora are dentate, but even in that case they evidently (judging from description) differ in respect of other characters.

I think the example before me is a female, but do not feel quite sure, as the front femora are more incrassate than in the males of most species, but rather slightly so for a female ; the sculpture of the rostrum is suggestive of the male.

Interior of S. Australia ; Mernmerna.

**B. abdominalis*, sp. nov. Angustus ; parallelus ; rufo-piceus squamis niveis ornatus, pedibus dilutioribus ; rostro cylindrico quam prothorax vix longiori, sat nitido, sat subtiliter punctulato (maris postice magis fortiter); antennarum articulis 3° 4° que longitudine inter se sat æqualibus; capite sparsim niveo-squamoso, granuloso-punctulato ; prothorace quam longiori vix latiori, sat crebre (fere ut *B. scalaris*, Germ.), granuloso, leviter canaliculato, canali niveo-squamoso, lateribus a basi fere ad apicem sat rotundatis, basi fortiter bisinuata ; elytris ad basin modice (paullo minus fortiter quam *B. scalaris)* lobatis, ad apicem singulatim acuminatis vix productis, sat fortiter (fere ut *B. scalaris)* punctulato-rugulosis, sparsim maculatim niveo-squamosis (præsertim juxta suturam); corpore subtus æqualiter niveo-piloso, maculis rotundatis denudatis ornatis, his in metasterno biseriatim in abdomine triseriatim longitudinaliter dispositis ; femoribus anticis muticis, posticis segmenti ventralis basalis apicem nullo modo attingentibus. Long. (rostr. incl.), $4\frac{1}{2}$—$5\frac{1}{2}$ l.; lat., $\frac{3}{5}$—$\frac{9}{10}$ l.

A very narrow elongate species, perhaps closely allied to the very insufficiently described *B. farinarius*, Pasc., and *B. vetustus*, Pasc., but I do not think it can be identical with either of them, as Mr. Pascoe calls the latter "modice elongatus," and says of the former that it is "shorter than *B. vetustus*," the present species being a *very* elongate one, even more so than *B. filiformis*, Germar. Mr. Pascoe gives no information as to whether the femora of those two species are dentate beneath. He describes the abdomen of *B. farinarius* as having "four denuded spots on each side" which does not fit the present insect, it having in addition four round denuded spots along the middle line. This pattern on the ventral segments, each of the first four segments having a transverse row of three sharply defined round denuded spots, distinguishes the present species from all its near allies.

W. Australia ; taken by E. Meyrick, Esq.

**B. elegans*, sp. nov. Sat angustus ; parallelus ; piceus, squamis cinereis ornatus, rostri apice rufo ; rostro cylindrico arcuato quam prothorax manifeste longiori, sat nitido, subtilissime punctulato ; antennarum articulo 3° quam 4^{us} sublongiori ; capite sparsim subtiliter granuloso, inter oculos sparsim cinereo-squamoso , prothorace quam latiori vix longiori, sat

sparsim granuloso (fere ut *B. scalaris*, Germ.), sat fortiter canaliculato, canali cinereo-squamoso, lateribus a basi fere ad apicem leviter arcuatis, basi fortiter bisinuata ; elytris ad basin modice (fere ut *B. scalaris*) lobatis, ad apicem singulatim acuminatis vix productis, sat crebre granuloso-rugulosis (haud distincte punctulatis), sat æqualiter (ad suturam haud magis quam in partibus ceteris) cinereo-maculatis, maculis inæqualibus nonnullis parvis nonnullis magnis intermixtis ; corpore subtus sat dense cinereo-maculatis, abdominis segmentis 1-4 utrinque macula rotunda denudata ornatis ; femoribus anticis subtus bidentatis, posticis segmenti ventralis basalis apicem vix superantibus. Long. (rostr. incl.), $4\frac{3}{5}$ l. ; lat., 1 l. (vix).

A very distinct species, owing to the large and small cinereous patches on the elytra not being especially connected with the suture ; the larger spots run more or less in two longitudinal rows on each elytron, of which the external one is scarcely less conspicuous than that nearer the suture. The general form is much as in *B. scalaris*, but less elongate, and with the elytra slightly more evidently at their widest behind the middle. This species is perhaps near *B. aphthosus*, Pasc., which, however, is so slightly described that it is difficult to form a clear idea of what it is like. It would seem, however, that it has a single tooth beneath all the femora, and that there are no denuded spots on its abdomen, both which characters furnish distinctions from the present insect.

S. Australia ; I am not sure of the exact habitat, but it is probably in the Northern interior.

**B. regalis*, sp. nov. Sat elongatus ; minus parallelus ; piceo-niger, squamis cinereis et nonnullis flavescentibus vittatim ornatus, elytris pedibusque (nonnullorum exemplorum) plus minusve rufescentibus ; rostro quam prothorax longiori, arcuato, nitido, subtilissime punctulato (maris basin versus paullo magis fortiter) ; capite mox intra oculos flavescenti squamoso, rugulose punctulato ; prothorax quam longiori sexta parte latiori, sat fortiter (fere ut *B. bidentati*, Don.) granuloso, cinereo 3-vittato, sat fortiter canaliculato, lateribus ab apice fere ad basin rotundatum divergentibus (fere ut *B. bidentati*), basi bisinuata ; elytris ad basin modice lobatis, ad apicem sat fortiter acuminato-productis, pone scutellum sat fortiter callosis, crebrius granulosis vel granuloso-punctulatis (fere ut *B. suturalis*, Boisd.), vittis 2 (scil. subsuturali cinerea et sublaterali flavescenti) squamosis ornatis ; corpore subtus ad latera et in medio dense in ceteris partibus crebre maculatim niveo-squamoso ; femoribus anticis

subtus minute bidentatis, posticis segmenti secundi ventralis partem median attigentibus. Long. (rostr. incl.), $7\frac{1}{2}$—$9\frac{1}{4}$ l.; lat., $1\frac{3}{10}$—$1\frac{3}{5}$ l.

A large and handsome species, at once distinguishable by the unusual markings of its elytra, which consist of a continuous ashy-white vitta on either side of the suture extending from the base to the apex, and a yellow vitta (abbreviated near the base and apex) not far from the lateral margin. These vittæ appear to be sprinkled with minute dark spots owing to the granules of the elytra protruding through them. In form and sculpture this species is extremely close to *B. suturalis*, Boisd., but it differs totally in colour and markings, and also in the presence of a well-defined hump behind the scutellum. It also probably resembles *B. subparallelus*, Jekel (which I have not to my knowledge seen), but is evidently distinct from it, as *inter alia* that species is described as "supra violaceo-niger, antennis rufis," and the narrowness of its prothorax (which is even called "subcylindrico-conic") is particularly mentioned, none of which expressions fit the present insect. The third and fourth joints of the antennæ are of about equal length. The male differs from the female by its more slender front femora, the stouter basal joint of its antennæ, and the less fine puncturation of the base of its rostrum.

S. Australia; Eyre's Peninsula; on *Casuarina*.

**B. Adelaidæ*, sp. nov. Sat elongatus; parallelus; piceus, squamis cinereis vittatim ornatus, rostro (basi excepta) læte sanguineo, antennis tibiis elytrisque plus minusve rufescentibus; rostro quam prothorax longiori, arcuato, subtilissime (basin versus minus subtiliter) punctulato; capite prothorace et elytris ut *B. regalis* squamosis, sed squamis omnibus cinereis, in prothorace vittis lateralibus minus perspicuis; capite et prothorace ut *B. regalis* granulosis; prothorace vix transverso, sat fortiter canaliculato, lateribus a basi fere ad apicem fortiter rotundatis, basi bisinuata; elytris ad basin minus fortiter lobatis, ad apicem acuminatis vix productis, pone scutellum haud callosis, sat crebre antice granulosis postice punctulatis; corpore subtus ad latera dense in medio minus dense niveo-piloso, mox intra partem dense niveo-squamosam linea gracili fere continua denudata ornato; femoribus anticis subtus bidentatis, posticis segmenti secundi ventralis partem mediam fere attingentibus. Long. (rostr. incl.), 5—$5\frac{4}{5}$ l.; lat., $\frac{4}{5}$—1 l.

The squamose markings of the upper-surface are almost exactly as in *B. regalis*, the scales, however, being all of an ashy colour, and those forming the lateral vittæ of the prothorax being less distinct. The markings of the under-surface differ in the absence

of the narrow median longitudinal line of dense pilosity which in that species traverses the otherwise-thinly pilose space between the lateral vittæ. The bright-red colour of the anterior two-thirds of the rostrum seems constant The small size and the scarcely-produced apex of the elytra at once distinguish this species from *B. regalis*.

S. Australia; on the hills near Adelaide.

**B. distinctus*, sp. nov. (Mas.) Angustissimus; parallelus; niger, squamis niveis ornatus; rostro postice crasse antice sat subtiliter punctulato, quam prothorax parum longiori, cylindrico, arcuato; antennarum articulis 3° quam 4^us^ sublongiori; capite prothoraceque minus crebre granulosis (fere ut *B. scalaris*, Germ.), hoc inter oculos niveo-squamoso; prothorace quam latiori sublongiori, canaliculato, canali dense niveo-squamoso, lateribus modice arcuatis, basi bisinuata; elytris ad basin modice lobatis (ut *B. scalaris*, Germ.), ad apicem minus acuminatis haud productis, pone scutellum haud callosis, crasse granuloso-punctulatis (fere ut *B. scalaris*, Germ.), vitta densa suturali (fere ut *B. suturalis*, Boisd.) et serie dorsali maculari bene determinata niveo-squamosis ornatis; corpore subtus dense niveo-piloso, segmentis ventralibus singulis maculis 3 denudatis (maculis medianis triangularibus) ornatis; femoribus anticis muticis, posticis segmenti ventralis basalis apicem haud attingentibus. Long. (rostr. incl.), $5\frac{1}{5}$ l.; lat.., $\frac{4}{5}$ l.

A very pretty species owing to the strong contrast between the black colour of the general surface and the white pilosity which forms a continuous stripe from the front of the prothorax to the apex of the suture, and also a longitudinal dorsal row (abbreviated in front) of small sharply-defined spots. The pattern on the ventral segments is much like that in *B. abdominalis*, but the denuded spots are much larger, the middle one on each segment (especially on the basal two segments) being of an elongate triangular shape.

S. Australia; Eyre's Peninsula.

**B. tibialis*, sp. nov. (Mas.) Sat elongatus; postice angustatus; rufus, squamis setuliformibus niveis vestitus, his in corpore supra (nisi in prothoracis canali et scutello) æqualiter sparsim in corpore subtus (nisi ad sternorum latera) æqualiter modice dense in scutello prothoracisque canali et ad sternorum latera densissime dispositis, segmentis ventralibus singulis macula parva mediana denudata ornatis, capite rostro antennisque piceis, elytrorum sutura infuscata; rostro sat gracili sat cylindrico sat fortiter arcuato, quam prothorax longiori subtiliter (postice magis fortiter) punctu-

lato ; antennarum articulis 3° 4° que longitudine inter se æqualibus ; supra sat crasse ruguloso-punctulatis ; prothorace quam latiori vix longiori, lateribus modice arcuatis pone apicem leviter sinuatis, basi bisinuatis ; elytris ad basin modice lobatis, ad apicem singulatim acuminatis vix productis, a basi retrorsum gradatim angustatis, latitudine majori trans humeros posita ; femoribus anticis subtus dentibus 2 armatis (altero elongato altero minuto), posticis ultra segmenti ventralis basalis apicem attingentibus ; tibiis anticis ad basin subito arcuatim angustatis, mox ante basin dente magno armatis et hinc ad apicem subtiliter denticulatis ; tarsorum anticorum articulo basali valde dilatato. Long. (rostr. incl.), $4\frac{4}{5}$ l.; lat., $\frac{4}{5}$ l. (vix.)

This is the most remarkable *Belid* I have seen ; it might with some reason be treated as the type of a new genus, owing to the following characters :—Antennæ inserted unusually near to the base of the rostrum, the whitish hair-like scales on the upper-surface evenly and thinly distributed, except in the prothoracic channel, and the remarkable structure (probably sexual) of the front legs. It may be noted that the same structure (except the large tooth below the base of the tibia) is feebly reproduced in the four hinder legs. All the vestiture is really white, but the variation in its density makes it appear to be of three different colours, sc., snowy white on the middle of the prothorax the scutellum and the sides of the sterna, less *snowy* on the abdomen, and still less on the elytra.

W. Australia ; sent to me by E. Meyrick, Esq

The following table shows the relation *inter se* of the species described above :—

A. Front femora unarmed.
  B. Elytra not callose behind the scutellum.
    C. Elytra not carinate.
      D. Elytra not longitudinally concave close to the suture.
        E. Elytra not (or scarcely) produced at the apex (at most much less than in *B. scalaris*, Germ.).
          F. Elytra coarsely sculptured (not less coarsely than in *B. scalaris*, Germ.).
            G. A continuous dense white stripe runs down the prothorax and elytral suture ... distinctus, Blackb

GG. The sutural pilosity forms sparsely-placed spots ... ... abdominalis, Blackb.
FF. Elytra much less coarsely sculptured ... ... difficilis, Blackb.
EE. Elytra produced at the apex (as in *B. scalaris*, Germ.) ... ... ventralis, Blackb.
DD. Elytra longitudinally concave close to the suture ... Helmsi, Blackb.
CC. Elytra carinate ... ... perplexus, Blackb.
BB. Elytra strongly callose behind the scutellum ... ... bison, Blackb.
AA. Front femora dentate beneath—the teeth equal.
B. Elytra not callose behind the scutellum.
C. Dorsal squamosity of the elytra (if any) forms spots.
D. Elytra strongly produced at apex.
E. Sides of under-surface with a stripe of dense white pilosity ... ... frater, Blackb.
EE. Under-surface entirely mottled with denuded spots ... ... Flindersi, Blackb.
DD. Elytra not produced at apex
E. Spots of pilosity on the elytra small, and placed chiefly along the suture... mundus, Blackb.
EE. Spots of pilosity on the elytra promiscuously scattered, and of very uneven size ... ... elegans, Blackb.
CC. Dorsal squamosity of the elytra forms a well-defined continuous vitta ... ... Adelaidæ, Blackb.
BB. Elytra callose behind the scutellum ... ... regalis, Blackb.
AAA. Front femora with two very unequal teeth ... ... tibialis, Blackb.

Haplonycini.

HAPLONYX.

A single example of this genus occurred in the district west of the Fraser Range. It is very near to *H. cionoides*, Pasc., but

does not quite agree with S. Australian specimens of that insect. I do not think, however, that it would be desirable to found a new species on a single example in this large and difficult genus, unless it presented some well-defined distinctive character, which the present species does not.

Cryptorhynchini.

neolybæba (gen. nov.).

Rostrum elongatum gracile leviter arcuatum; scrobes (exempli typici) medianæ sat rectæ; oculi grosse granulati; antennæ sat graciles, funiculo 7-articulato; prothorax ad basin fortiter bisinuatus, lobis ocularibus latis; coxæ anticæ contiguæ; femora subtus dentata (anticis angulatis magis quam perspicue dentatis); unguiculi liberi; abdominis segmentum basale (quam metasternum parum longius) quam 2^{um} fere duplo longius, hoc quam 3^{us} 4^{us} que conjuncti parum breviori, sutura prima parum arcuata.

The species for which I propose this new name does not appear capable of being referred to any existing genus. It belongs to the group of *Cryptorhynchides* in which the rostral canal is very short (not separating the anterior coxæ), and which consequently form a connecting link between the *Cryptorhynchides* and *Erirhinides*. Among these it is distinguished by the following characters in combination; rostrum elongate and not subulate, eyes very coarsely facetted (as in *Melanterius*), base of prothorax strongly bisinuate, femora dentate beneath, body densely clothed with scales. The general form is extremely like that of the *Erirhinid* genus *Gerynassa*. Probably *Lybæba* is really the nearest ally of this genus.

N. remota, sp. nov. Testaceo-rufa; squamis rufis albidisque (his maculatim intermixtis) confertim vestita; rostro quam prothorax paullo longiori, glabro nitido (parte basali squamosa excepta); antennarum funiculi articulis basalibus 2 elongatis, ceteris sat brevibus; prothorace quam longiori paullo latiori, antice subtubulato; elytris subtiliter punctulato-striatis, interstitiis 3° 5° que apicem versus (et 7° antice) convexis, humeris extrorsum prominulis, interstitiis 3° 5° 7° que hic illic obtuse tuberculatis. Long. (rostr. excl.), $2\frac{1}{5}$ l.; lat. 1 l.

The whitish scales are the most numerous; regarding them as the ground-colour, the red scales form two large ill-defined blotches near the base of the prothorax, and a number of small ill-defined spots on the elytra. The scutellum is white.

Everard Range.

MELANTERIUS.

M. vinosus, Pascoe. Mount Squires.

AXIONICUS.

A. insignis, Pascoe. Victoria Desert.

LONGICORNES.

PACHYDISSUS.

P. Tatei, Blackburn. Murchison District.

PHORACANTHA.

P. semipunctata, Fabricius. Fraser Range.

ATESTA.

This species differs from *Atesta* in the spine of the third joint of the antennæ being almost obsolete, the corner of the joint where the spine might be expected being merely a little produced in a sharp point. The three species which Mr. Pascoe associated to form this genus are characterised as *Phoracanthids*, having the characteristics of their group reduced to a minimum, the antennal spines being only one or two, and the apical spines of the elytra nearly or quite obsolete. This species reaches the lowest point in these respects of any yet described, the spines of the elytral apex being quite, and those of the antennæ all but, wanting.

A. eremita, sp. nov. (Mas.) Sat angusta; minus nitida; sat sparsim pubescens et capillis elongatis erectis vestita; piceo-nigra, antennis (quam corpus paullo longioribus) palpis pedibus et corpore subtus (abdominis lateribus apiceque exceptis) ferrugineis; elytris apicem versus crasse profunde (retrorsum gradatim minus profunde magis subtiliter) punctulatis, flavo-maculatis; ad apicem rotundatis; antennarum articulis 3° 4° que brevissime vix perspicue spinosis. Long., 9 l.; lat. $2\frac{1}{5}$ l.

The yellow marks on each elytron are two spots a little behind the base (placed transversely and probably in some examples confluent), a large irregularly-shaped spot about the middle, not quite reaching either the suture or the lateral margin, and a spot occupying the apex. The head and prothorax are somewhat finely and closely, but not very distinctly, punctured, the latter bearing a median lanciform nitid space with about six ill-defined more or less nitid tubercles on each side, some of them more or less run together (probably variously in different examples) so that they are difficult to count. The length of the prothorax is about equal to its width. On each side one of the tubercles being placed on the lateral declivity makes the segment appear protuberant in the middle when looked at from above. All the

femora are extremely stout, a character very likely to be sexual.

This species is very near to *A. Tatei*, Blackb., but is very distinct from it by reason *inter alia* of its much less nitid surface and the absence of an apical elytral spine, also the presence of yellow markings between the base and middle of the elytra which I have not seen in any example of *A. Tatei*.

Victoria Desert.

APHANASIUM.

I feel considerable hesitation in referring the following species to this genus. Probably Mr. Pascoe (who has done the largest part of the work hitherto on the Australian Longicorns) would found a new genus for it, but as the genera already formed for species more or less allied to the present insect are numerous and perplexing, I am anxious to avoid any risk of increasing the difficulty. Fortunately this particular insect presents notable specific characters that will render its identification easy, and it is certainly very near to *Aphanasium*. In M. Lacordaire's arrangement of the *Cerambycides* the following characters—eyes coarsely granulated, intermediate coxæ open laterally, abdomen slender and cylindrical, with the apical segment elongate—bring its possible location within somewhat narrow limits, and the additional character of its labial and maxillary palpi being equal (or nearly so) *inter se* in length, reduces to two *(i.e., Neostenides* and *Aphanasiides)* the subfamilies in which it could be placed. These two subfamilies appear to me to be very close; M. Lacordaire distinguishes them *inter se* in his tabulation by the anterior coxæ of the former being "moderately prominent," and of the latter "prominent" (a distinction which I do not find workable, as there is, *e.g.*, no marked difference in this respect between *Neostenus Saundersi*, Pasc., and *Aphanasium australe*, Boisd.), and adds in his detailed descriptions several slight and unsatisfactory distinctions, together with the more definite one that in the former the legs are short, the hind femora never reaching beyond the second ventral segment, while in the latter they are "moderately long." In the present insect the front coxæ are about as prominent as in the two species mentioned above, but as the hind femora reach considerably beyond the second ventral segment (being about as long as in *Aphanasium australe)* I must regard the species as an *Aphanasiid*. *Aphanasium* is the only Australian genus of the subfamily yet noticed (unless *Myrsus*, whose habitat is unknown, be Australian, to which genus, however, the present species cannot, I think, be referred, especially as Lacordaire's characters for it in his tabulation and his diagnosis flatly contradict each other; at any rate, the *species* is very unlike the present one)' The abdomen of the insect before me is considerably more narrowly-cylindrical and *Neostenus*-like than

that of *Aphanasium australe*, its hind tarsi (especially the basal joint) are evidently less elongate, and its eyes (in the male) are less widely separated above, but I do not find any other structural character inconsistent with its being congeneric with *A. australe*, although it is very unlike it in size and colouring. It is quite possible that the form of the abdomen may be to some extent due to abnormal shrinkage in drying, and as the comparative approximation of the eyes is not a good generic character, there remains only the form of the hind tarsi, and this seems to me scarcely a sufficient character to require the creation of a new generic name.

In some respects (especially in the colouring and markings) this species resembles *Didymocantha obliqua*, Newm., which I cannot regard as at home among the *Callidiopsides*, where M. Lacordaire places it, its facies being extremely unlike *Callidiopsis*, and the structure of its intermediate coxæ being different from that genus. As, however, the meso-thoracic epimera in the present insect are in contact with the intermediate coxæ, and are separated from them in *Didymocantha*, the two could not in Lacordaire's classification be associated.

It should be noted that the underside of the four posterior femora in this species is concave longitudinally, and is filled (probably in the male only) with short woolly pubescence.

A. variegatum, sp. nov. (Mas). Modice elongatum, sat parallelum; nigrum, elytris (his fusco-notatis) metasterno medio coxis femorum basi summa tibiarum parte basali dimidia tarsis et antennis lividis, harum articulis 1° (basi summa excepta) 3° —5° (ad apicem summum) 6° 7° que in parte apicali dimidia infuscatis; sparsim pubescens; capite brevi sat fortiter sat crebre punctulato; prothorace sat transverso, ut caput punctulato, 11-tuberculato [sc. ante basin transversim 5-tuberculato (tuberculis externis spiniformibus), pone apicem 4-tuberculato, et utrinque tuberculo laterali mediano munito] sic ut latera de super visis tuberculos tres (horum posteriori spiniformi) præbent; elytris ad apicem rotundatis, obsoletissime bicostatis, quam prothorax paullo minus crebre punctulatis, notis fusco-nigris ornatis (sc. linea a humeris retrorsum et suturam versus arcuata, macula marginali mox pone basin, fascia mediana sat angusta in sutura retrorsum producta) et apicem versus indeterminate infuscatis; antennis sat compressis, quam corpus sesquilongioribus, articulis 1° 3° 4° que inter se longitudine sat æqualibus, ceteris sat longioribus; femoribus 4 posticis subtus longitudinaliter depressis et dense breviter lanuginosis. Long., 7 l.; lat., $1\frac{3}{5}$ l.

The prothorax bearing two well-defined tubercles and a spine

on each side, together with the colouring and the elytral pattern resembling the same in *Didymocantha obliqua*, Newm., and the bright livid patch in the middle of the metasternum, will render this species easy of identification.

Murchison District.

APOSITES.

A. niger, Blackburn. Murchison District.

A. lanaticollis, Blackburn. Murchison District.

STEPHANOPS.

**S. nasuta*, Newman. Albany.

SYLLITUS.

S. grammicus, Newman. Fraser Range.

S. uniformis, sp. nov. Supra ferrugineus, antennarum articulo basali femoribus tibiisque concoloribus, antennis (articulo basali excepto) capite tarsisque dilutioribus, prothorace plus minus infuscato; corpore subtus (capite excepto) nigricanti; prothorace quam latiori paullo longiori, ab apice ad medium sat cylindrico, a medio ad basin leviter rotundato-ampliato, supra vix inæquali, crebre subtiliter ruguloso; elytris modice (quam prothorax minus crebre minus subtiliter) rugulosopunctulatis, costis discoidalibus binis sat parallelis instructis. Long., $3\frac{1}{2}$—$3\frac{3}{4}$ l.; lat., $\frac{3}{5}$ l.

Very distinct from the previously described species of the genus by reason of the dark ferruginous general colour of its upper-surface, the elytral costæ being concolorous and only the head exhibiting a brighter reddish tone.

Fraser Range; I have this species also from S. Australia.

MICROTRAGUS.

M. maculatus, Blackburn. Nilpena or thereabouts.

HEBESECIS.

H. fasciculatus, sp. nov. Niger, tomento nigro-griseo et fusco variegatus, antennarum basi tibiisque nonnullorum exemplorum rufescentibus; capite prothoraceque spinoso confertim punctulatis; elytris profunde seriatim punctulatis, in dorso pone basin tuberculo nigro-fasciculato et altero minori pone medium ornatis; antennis pubescentibus, pube in articulis 3° 4° 5° 7° que ad basin, 6° 8° que totis albida. Long., $4\frac{1}{5}$—5 l; lat., $1\frac{3}{5}$—$2\frac{2}{5}$ l.

This species seems very distinct from any other yet described. The arrangement of the colours of the tomentum on the upper surface is very much as in *H. australis*, Boisd., but the pubescence of the sides of the prothorax (which has no dorsal impres-

sion) is of a pale-greyish colour, and the antennæ are very differently coloured; the basal half (or more) of joints 3 and 4, the basal one-third of joints 5 and 7, and the whole of joints 6 and 8 being clothed with whitish pubescence, joints 9 to 11 and the appendiculate 12th joint being of an obscure patchy colour inclining more or less to grey or blackish in different examples. The pubescence of the underside and legs is whitish, and is somewhat close and even, scarcely interrupted or spotted except by the very coarse granulose-puncturation of the metasternum. The antennæ are about half again as long as the body in the male, not much longer than the body in the female. Of the other species of the genus having pilose elevations on the elytra *H. basalis*, Pasc., is very differently coloured and has only one elevation on each elytron; *H. cristata*, Pasc., *inter alia* has the antennæ of the male more than twice as long as the body, and *H. niphonoides*, Pasc., has two costæ on the elytra and the tibiæ marked with rings of brown pilosity. The posterior elevations on the elytra in this species are much smaller than the anterior ones, but are quite well-defined.

Fraser Range; also in my collection from other places in W. Australia.

SYMPHILETES.

S. fraserensis, sp. nov. Ferrugineus, capite antennis femoribus tibiis prothorace antice ad latera scutello et corpore subtus (lateribus summis exceptis) albido-pubescentibus, elytris fulvo-pubescentibus, pone et circa scutellum et in sutura griseo-pubescentibus (linea suturali serie macularum nigrarum variegata), ad latera vitta niveo-argentea lata ornatis (hac a basi apicem attingenti, ad basin breviter angustata, margine superiori insigniter serrato) humeris fere nigris; antennis quam corpus maris paullo longioribus, feminæ vix brevioribus; prothorace leviter transverso, subcylindrico, minus inæquali, supra sat crebre sat subtiliter rugato; elytris leviter minus subtiliter punctulatis, in parte dimidia basali sat fortiter granulatis, ad apicem leviter emarginatis barbatis; coxis anticis inermibus. Long., 8 l.; lat., $2\frac{3}{5}$ l.

The inequality of the surface of the prothorax is very slight and ill-defined, consisting of little more than a transverse depression near the front, and another (the stronger of the two) near the base. The prothorax has no indication of tubercles except a small tubercle (or large granule) on each side near the front. The most distinctive characters of this species seem to be the dense white pubescence entirely clothing the head and antennæ, the very conspicuous leaden-grey pubescence of the suture bearing (on each elytron) a row of round black spots, and

the lateral band of a silvery-white colour. The upper margin of this band rises from the front extremity of the lateral margin, and runs obliquely hindward, and towards the suture to a point immediately behind the black humeral callus, whence it runs in a straight line (parallel with the suture) to the apex; it is marked with about a dozen sharply-defined little indentations, each of which is occupied by a granule or large puncture. Several species previously described resemble this one more or less closely, especially in the combination of a prothorax devoid of strong transverse folds with elytra ornamented laterally with snowy-white pubescence. I have in my collection examples of nearly all of them, but as in the instance of one or two there is a possible doubt of their being correctly identified, I will content myself with mentioning the following characters in which (according to their description) they differ *inter alia* from the present insect. *S. Bathursti*, Pasc., has two small central tubercles on the prothorax, *decipiens*, Pasc., is of a greyish-green colour and has a small triangular dark spot behind each eye, *derasus*, Pasc., has six feeble tubercles on the prothorax, *Duboulayi*, Pasc., has the lateral snowy pubescence of the elytra in the form of an oblong spot, *iliacus*, Pasc., is a smaller insect of dark olive-green colour, *lateralis*, Pasc., has the general pubescence of the head fulvous.

Fraser Range.

S. fumatus, Pascoe. Fraser Range.

S. vestigialis, Pascoe. Fraser Range.

Phytophaga.

Ditropidus.

D. cistellus, Germar. Fraser Range.

D. histeroides, Suff.? Fraser Range.

Chrysomela.

C. australica, sp. nov. Elongata; parallela; nitida; convexa; ænea, labro palpis antennis pedibus elytrorumque epipleuris rufescentibus; capite lato minus convexo, sat crebre sat fortiter punctulato, inter oculos fovea sat magna impresso; oculis obsoletissime nec subtiliter granulatis: prothorace transversim subquadrato, quam elytra parum angustiori, sparsim minus fortiter (ad latera paullo magis fortiter magis crebre) punctulato; elytris seriatim punctulatis, interstitiis vix perspicue transversim strigosis. Long., $3\frac{1}{2}$ l.; lat., $1\frac{3}{5}$ l.

This species is clearly, I think, a member of Dr. Baly's genus *Carystea*, which Dr. Chapuis regards as inseparable from *Chrysomela*. If the eyes of all the previously described species are like those of the present one, I think Dr. Baly's genus may

be maintained ; the granulations are not particularly fine, but are so extremely faint as to appear almost non-existent without the use of a powerful lens. This species is probably near *C. micans*, Baly (which I have not to my knowledge seen), but is considerably larger and *inter alia* the puncturation of the sides of its prothorax is not in the least variolose.

Fraser Range.

CHALCOLAMPRA.

C. eremita, sp. nov. Ovalis ; picea, capite rufo, antennis palpis pedibusque brunneo-testaceis, prothorace elytrisque obscure æneis ; prothorace duplo-punctulato ; elytris sat subtiliter striatis, striis sat fortiter punctulatis, interstitiis sublævibus vix planis. Long., $2\frac{2}{5}$—$2\frac{1}{2}$ l. ; lat., $1\frac{2}{5}$ l.

The third joint of the antennæ is not much less than half again as long as the fourth joint. The head is somewhat strongly but not at all closely punctulate, and has a fovea on either side near the front. The prothorax is two-thirds again as wide as long, and is considerably narrowed forward ; it bears both fine and also considerably larger punctures (both kinds sparsely distributed except near the sides, where the larger punctures are much closer). The evident (though not strong) convexity of the interstices associates this species with *C. Hursti*, Blackb., from which it differs *inter alia* by the less strongly rounded sides and the narrower front of its prothorax, as well as by its smaller size. Compared with *C. acervata*, Germ., (which is perhaps the same as *ænea*, Boisd.) the antennæ are much less stout, with the third joint proportionally longer ; the prothorax is much more narrowed in front and much less coarsely punctured ; the elytra are very similar, except in the interstices not being quite flat ; and the puncturation of the under-surface does not appear to differ in any notable manner.

Fraser Range.

CALOMELA.

C. satelles, sp. nov. Oblonga ; pallide fulva, antennis apicem versus nigris, elytris vitta discoidali plus minusve perspicua violacea ornatis ; capite rugulose (quam *C. coloratæ*, Germ., multo minus crasse) punctulato ; prothorace quam longiori plus quam duplo latiori, crasse fortiter (in medio quam *C. coloratæ* minus crebre) punctulato ; elytris fortiter (quam *C. vittatæ*, Baly, vix minus fortiter) punctulato-striatis. Long., $2\frac{2}{5}$—3 l. ; lat., $1\frac{1}{5}$—$1\frac{2}{5}$ l.

A very distinct species, easily distinguished from its congeners with fulvous elytra bearing a vitta of metallic colour by the following characters in combination :—Colour entirely pale fulvous, except the apical part of the antennæ and the dusky-violaceous

vitta of the elytra, prothorax coarsely punctured (after the manner of that of *C. colorata*, Germ.), elytra regularly punctulate-striate (except a little confusion in the dorsal rows) as in *C. vittata*, the punctures extremely deep and large (almost as in *C. vittata*, much more coarse than in *C. colorata*, *C. Kirbii*, &c.).

Fraser Range; I have the same species from various localities in S. Australia.

C. imperialis, sp. nov. Oblonga; nigra, supra splendide viridi-cyaneo-aureo et purpureo-micans, pedibus æneo- et cupreo-iridescentibus, antennis ad basin rufis; capite magno sat crebre sat fortiter punctulato, longitudinaliter subtiliter canaliculato; prothorace quam longiori plus quam duplo latiori, sat fortiter sat sparsim (ad latera magis crasse minus sparsim) punctulato, postice quam antice fere tertia parte latiori; elytris vix striatis seriatim sat fortiter punctulatis, interstitiis fere lævibus. Long., 4 l.; lat., $2\frac{1}{5}$ l.

A remarkably handsome species, very distinct from its previously described congeners. The blending of the iridescent colours on the upper-surface is almost too intricate for detailed description; on the head there are four transverse, not sharply-defined, zones of colour as follows (from the hinder part forward): —golden, purple, cyaneous, purple; on the prothorax the zones are longitudinal, being purple in the middle, and on either side successively green, purple, green. On each elytron, starting from the suture, there are longitudinal vittæ as follows:—purple, green, purple, green, purple, green. The wings are of a rich crimson colour. The head is singularly like that of *Chrysomela* (*Carystea*), except in its eyes being more strongly granulated; indeed, the insect bears a strong general resemblance to *Carystea*, with the claws of a *Calomela*.

Nilpena, or thereabouts.

PAROPSIS.

P. lateralis, sp. nov. Breviter ovalis; minus nitida; nigro-picea, capite prothorace elytrorum margine laterali pedibus antennarum basi et maculis 2 (in segmento ventrali apicali positis) ferrugineis; capite fortiter subrugulose punctulato; prothorace quam longiori triplo latiori, sat subtiliter sat crebre (ad latera crasse confertim) punctulato, lateribus sat arcuatis; elytris sat fortiter vix seriatim punctulatis et lineolis sublævibus nonnullis instructis. Long., $5\frac{1}{5}$ l.; lat., $4\frac{1}{5}$ l.

This species belongs to Dr. Chapuis' "second division" of the genus; none of the described species in that division bear much resemblance to it.

Nilpena, or thereabouts.

P. squiresensis, sp. nov. Ovata; minus nitida; nigro-picea, labro antennis pedibusque rufescentibus; capite prothoraceque sat fortiter sat crebre punctulatis; hoc ad latera magis crasse punctulato, quam longiori paullo magis quam duplo latiori, lateribus sat arcuatis, postice quam antice vix dimidio latiori; elytris crassissime rugulose punctulatis, in parte dimidia apicali sat crebre (apicem versus creberrime) verrucosis. Long., $3\frac{1}{2}$—4 l.; lat., 2—$2\frac{2}{5}$ l.

This species is a member of Dr. Chapuis' "fourth division" of the genus. In shape it resembles *P. caliginosa*, Chp., except in its prothorax being very evidently less transverse; the prothorax is much more closely and evenly punctured, and the elytra are very differently sculptured, there being no defined tuberosities on the anterior half, but numerous closely and irregularly placed ones on the posterior half, especially near the apex.

Mount Squires.

P. nigropicta, Clk. ? Several specimens appertaining to an extremely variable species appear to be the insect to which it is probable that Mr. Clark gave this name. No individual among them agrees exactly with the description, and no two of them are quite identical *inter se*. They are of a bright red colour with black markings, which vary considerably in size and shape. In some the labrum is black (as in Clark's description), in others red, in some the legs are red with dark markings (as in description), in others almost black, and the colour of the under-surface varies from red (as in description) to nearly black. The species to a casual glance bears a remarkable resemblance to *Coccinella repanda*, Casstroem.

P. variabilis, Chp., var. ? West of Fraser Range. The prothorax seems a little more closely and strongly punctured than in S. Australian examples, and it is possible this may indicate a distinct species.

MENIPPUS.

M. elegans, Blackb. As noted (in Proc. Linn. Soc. N.S.W., 1890, p. 362) the structural characters of this insect do not agree quite satisfactorily with those of the typical species of *Menippus*.

Nilpena; on flowers of *Santalum acuminatum*.

BROSCIDES

(SUB-FAM. OF COLEOPTERA).

By THOMAS G. SLOANE, F.E.S.

Before dealing with the species of the sub-family *Broscini* which follow, it is necessary to offer some remarks on the classification of those Australian Broscides which are characterised by having the sinus of the mentum without any median tooth-like projection. These are comprised in five genera, viz., *Gnathoxys* (Westwood), *Parroa*, *Adotela*, *Cerotalis* (Castelnau), and *Brithysternum* (Macleay, W.). It is only with those species that fall into the genera *Parroa*, *Adotela*, and *Cerotalis* that we are at present concerned. In forming these three genera, Count de Castelnau (Trans. Roy. Soc. Victoria, VIII., 1868) relied entirely on features belonging to the male to separate them from one another. The differences he gives may be tabulated as follows :—

Male with last joint of palpi thick, oval, truncate ; anterior tarsi not clothed with spongiose tissue below. *Parroa.*

Male with last joint of palpi securiform ; three basal joints of anterior tarsi with spongiose tissue below. *Adotela.*

Male with last joint of palpi truncate ; four basal joints of anterior tarsi with spongiose tissue below. *Cerotalis.*

The late M. Putzeys, in monographing the *Broscini* in 1868 (Stett. Ent. Zeit.), united Castelnau's genus *Cerotalis* with *Promecoderus*, but followed that author in maintaining *Parroa* and *Adotela* as separate genera. Returning to the subject in 1873, he reviewed the Broscides of the Castelnau collection (Ann. Mus. Civ. Genov., IV.), when he still united *Cerotalis* with *Promecoderus*, and also united *Parroa* with *Adotela*, believing the genus *Parroa* had only been founded on female specimens of *Adotela*. He remarks (p. 337)—"Toutes les *Parroa* de la collection sont des males et les *Adotela* females ne différent pas des *Parroa*,"

In 1890, when reviewing the genus *Promecoderus* and the Australian Broscides allied to it (Proc. Linn. Soc. N.S.W. (2), V.), I regarded (as I still do) *Cerotalis* as distinct from *Promecoderus*, but I united *Parroa* with *Adotela*, remarking (p. 229) :— "When de Castelnau wrote on the Australian *Broscini* in 1867, he was misled by the very different form of the palpi in the different sexes of this genus, and formed a separate genus for each sex." In extenuation of my mistake in thus misrepresent-

ing the value of Castelnau's observations on these insects, I can only plead that I thought M. Putzeys' evidence that all the species of *Parroa* in the Castlenau collection when he went over them in 1873 were females, was conclusive proof Castelnau was in error in attributing to the males of *Parroa* nonsecuriform palpi and non-spongiose anterior tarsi.

I have now seen three species in which the male is certainly without spongiose tissue on the underside of any joints of the tarsi; so it is evident Castelnau was right. Either such male specimens must have been lost before M. Putzeys looked through the Castlenau collection; or he spoke after a mere superficial examination of the specimens before him, when he said all the species of *Parroa* were females.

I am now able to make a considerably more extended review of the forms comprised in the genera *Parroa*, *Adotela*, and *Cerotalis* than in 1890; but my knowledge of the previously described species is confined to so few species that I can suggest no alteration in their classification, nor can I find any decided differences, apart from sexual characters, between them. Genera founded entirely on features appertaining to one sex seem to me too artificial to be maintained in a natural system of classification; but, when our knowledge of a group is too slight to enable us to divide it into genera of undoubted natural value, an artificial system must be adopted, and this seems such a case. As will be seen from my remarks on the genus *Parroa*, which follow, I am doubtful of the position of many species; but the material I have clearly indicates that, either all the species now placed in the genera *Parroa*, *Adotela*, and *Cerotalis* will have to be united in one genus, or new genera will in all likelihood be required for *Parroa (Adotela) australis*, Sl., and similar forms; for *Parroa apicalis*, Sl.; and possibly for *Adotela Frenchi*, Sl. There seems little doubt but that we may expect many new species of *Broscini* to be found in Australia, which, when obtained, will enable us to determine the true classificatory value of the differences between forms such as those on which the genera *Parroa*, *Adotela*, and *Cerotalis* have been established. In the meantime, to make new genera for apparently aberrant forms would in all probability merely cause confusion and instability of nomenclature, troubles already only too rife in zoology.

Genus Parroa.

I regard *P. Howitti*, Casteln., as the type of the genus *Parroa*; with it may be associated *P. grandis*, Casteln., and *P. noctis*, Sl. (n. sp., *vide post*). These species seem united by a similarity in the form of the labrum, antennæ, femora, posterior trochanters, tarsi, &c.; but, as the male of neither *P. grandis* nor

P. Howitti has yet been recorded, there must remain some doubt as to the amount of affinity amongst them.

Adotela australis, Sl. (which I now know to have the male with non-securiform palpi, and non-spongiose anterior tarsi); *Adotela atronitens*, Sl. (which is too closely allied to *Parroa australis*, Sl., to be disassociated from it); and *Parroa lævigata*, Sl. (n. sp., *vide post*), form a group distinguished from the *P. Howitti* group by their emarginate labrum, lighter and less flattened femora, not channelled below for their whole length; narrower posterior tarsi, with apical joint narrowed to base; short very obtuse posterior trochanters; bordered basal margin of prothorax, &c. *Parroa apicalis*, Sl. (n. sp., *vide post*) may possibly be an *Adotela*; in any case it has but little affinity to either of the groups mentioned above. Three other species have been referred to the genus *Parroa* by De Castelnau, viz., *P. carbonaria*, Casteln.; *P. violacea*, Casteln.; and *P. bicolor*, Casteln. These are only known to me by too short descriptions, but I should think *P. carbonaria* was rightly placed in *Parroa*, while *P. violacea* and *P. bicolor* may likely prove species of *Adotela* when the male is reported. Three species of *Adotela*, viz., *A. striolata*, Putz.; *A. nigerrima*, Macl., and *A. frenchi*, Sl., have been described without any notice of the male. I should think it quite likely that they will all prove to have the male characters those of *Parroa* rather than of *Adoleta*, but they must remain in the latter genus till the male is recorded.

Parroa grandis, *Castlenau.*

Trans. Roy. Soc., Victoria, 1868, VIII., p. 174; Putzeys, Stett. Ent. Zeit., 1868, p. 350; *Adotela grandis*, Putzeys, Ann. Mus. Civ., Genov., 1873, IV., p. 337; Sloane, Proc. Linn. Soc., N.S.W., 1890 (2), V., p. 237.

Female.—Form broad, convex, robust. Black, shining. Head broad, short (6 x 6·5 mm.), smooth, excepting a slightly rugulose shallow impression on each side between the eyes; clypeal suture distinctly impressed, curved; clypeus truncate, declivous in front, a small puncture on each side very near the edge; eyes round, convex, not prominent or inclosed behind. Mandibles short, strong. Labrum short, without median sulcus; anterior angles quite rounded off; middle of anterior margin truncate. Antennæ short, thick, subfiliform; the joints very little flattened, second shortest—shorter than the fourth—last oval, pointed at apex. Prothorax broader than long (8·5 x 10·5 mm.), widest about halfway between the marginal punctures, lightly and shortly narrowed behind, convex (the disc a little depressed), not declivous behind, longitudinally rugulose near anterior and basal margins (the rugæ of the basal part stronger and more irregular); anterior

margin somewhat sinuate between the lateral borders; base truncate, not bordered; anterior angles broadly and shortly advanced, obtuse, their inner margin very oblique; basal angles rectangular; lateral border *entire*,* thick, narrow in middle, widening in front to anterior angles, thicker and more prominent behind, not sinuate before the base; median line rather strongly impressed, not reaching anterior margin, losing itself in the rugulose part behind. Elytra smooth, broadly oval (18·5 x 11 mm.), subparallel on sides, shortly rounded to peduncle, broadly rounded behind, convex, declivous behind, hardly at all declivous to peduncle behind scutellum; suture deeply impressed on disc; border narrow, slightly wider behind; a row of unequally and rather widely-placed punctures at a little distance from the margin. Prosternum transversely and irregularly striolate in front of the coxæ, strongly declivous to anterior margin, not excavate between the coxæ, truncate behind. Inflexed part of pronotum projecting sharply beyond the episterna. Ventral segments covered with fine irregular scratches; apex rugulose. Femora broad, flattened, irregularly transversely striolate, longitudinally excavate below for whole length; posterior ones strongly dilatate on lower side behind the middle: anterior tibiæ wide at apex, ending externally in a dentiform projection, outer edge thin with one or two very minute projections; four posterior tibiæ dilatate at apex, their outer edge concave: posterior trochanters transversely striolate, oval, narrowed to apex and obtuse: posterior tarsi of moderate length; joints 1—4 successively shorter, first not as long as two succeeding ones together, last short, convex, hardly narrower at base.

Length, 29; breadth, 11 mm.

Habitat.—Murchison District, West Australia.

This is the largest species of the genus, its affinity is to *P. Howitti*, Casteln., from which its greater size and broader form help to distinguish it. I have only seen the specimen described above, and have been unable to compare it with *P. Howitti*.

The description above may be supplemented by reference to the following points, the value of which, though I have found them worthy of notice in separating the species of *Parroa* and *Adotela*, I have not been able to satisfactorily determine from want of a sufficient number of specimens to examine. The sinus of the mentum is bordered, thus causing the bottom of the emargination to assume a lightly bisinuate form, the middle being

*The lateral border of the prothorax being sometimes (as in *Adotela Frenchi*, Sl.) obsolete before reaching the base, I have, for the sake of brevity, thought it convenient to call it *entire* when it reaches uninterruptedly along the sides from the anterior to the basal margin.

somewhat produced; the penultimate joint of the labial palpi is plurisetose in front and dilatate towards the apex; that of the maxillary palpi is short and triangular, with a seta projecting forward internally; these features are found in other species of the genus and also in some species of *Adotela*. The puncture usually found among the CARABIDÆ towards the outer side of the anterior femora, near the apex, is wanting.* The posterior coxæ have only a single puncture on each near the inner margin, a little before the insertion of the trochanters.† In all allied species known to me this puncture is present. In the specimen before me the anterior part of the clypeus is covered with minute punctures.

Parroa noctis, *spec. nov.*

Form rather elongate, convex, robust, smooth on upper surface. Entirely of a deep shining black. Head large (6 x 6 mm.), convex, smooth; frontal impressions obsolete; clypeal suture lightly marked, extending forward obliquely on each side; clypeus truncate, a foveiform puncture on each side; eyes convex, not prominent or inclosed behind. Mandibles strong, elongate. Labrum prominent, subrotundate in front, longitudinally sulcate in middle. Antennæ rather thick, filiform; basal joint‡ thick, second shorter than fourth, last narrow, fusiform. Prothorax very little broader than long (8·75 x 9·25 mm.), widest rather before the middle, gently and but little narrowed behind, lightly convex, not declivous behind; basal part defined by a shallow broad

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* I believe the presence or absence of this puncture (which I propose to call *the external apical puncture* of the anterior femora) to be of some classificatory value among the CARABIDÆ; its presence is invariable in all the Australian Broscides I have seen, excepting the present specimen. If normally absent in *P. grandis*, it seems probable its loss is owing to the rugosity of the part of the femur where it is usually found. It is almost obsolete in *P. noctis*, Sl.

† The punctures found on the posterior coxæ of nearly all the CARABIDÆ seem capable of use in classification, but I have not been able to find that they have yet been so used, or to come to any definite conclusion as to how much value attaches to them. The usual number of these punctures among the CARABIDÆ seems to be three; and, as one, two, or all three of these may be wanting, it appears necessary if they are to be referred to, for them to be named. I therefore propose the names—(a) *anterior puncture*, (b) *apical puncture*, (c) *inner marginal puncture* of posterior coxæ; according as they are placed—(a) at about half the breadth of the anterior part of the coxa, (b) near the apex of the coxa, (c) near the inner margin of the coxa a little before the insertion of the trochanters. When all three punctures are present the coxæ may be called *tripunctate*.

‡ It may be noted that in this species the setigerous puncture usually so conspicuous on the upper side (towards the apex) of the basal joint of the antennæ among the CARABIDÆ is wanting. This puncture may prove of classificatory value in some groups of the CARABIDÆ. *P. noctis* is the only Broscide that has come under my notice in which it has been wanting.

impression reaching almost to the sides at their posterior sinuosity ; anterior margin truncate between the lateral borders ; base truncate, not bordered ; anterior angles advanced, obtuse, their inner margin slightly oblique ; basal angles rectangular; lateral border *entire*, thick, gradually widening in front from anterior marginal puncture, narrower and equal backwards from that puncture, lightly sinuate before the base ; median line lightly impressed, not reaching either margin. Elytra smooth, oval (16·5 x 10 mm.) subparallel on sides, gently rounded to peduncle and to apex, convex, very declivous behind, hardly at all declivous to peduncle behind scutellum ; suture lightly impressed ; border narrow, becoming wider behind ; a row of unequally and widely-placed punctures at a little distance from the margin. Prosternum transversely impressed in front of coxæ, rounded behind and projecting slightly backwards, not excavate between coxæ, sharply declivous to anterior margin. Ventral segments smooth, impunctate. Femora broad, flattened, very lightly channelled below for whole length ; posterior ones strongly dilatate on lower side behind middle : anterior tibiæ with external edge smooth, not ending in a dentiform projection at apex ; four posterior tibiæ dilatate at apex, their outer edge not concave : posterior trochanters (in the male) very long, pointed, bent inwards near apex : posterior tarsi short, thick ; joints 1–4 successively shorter—first, short (not as long as two succeeding ones together), 2–4 short, broad, turbinate, last convex, not narrowed to base.

Length, 28 ; breadth, 10 mm.

Habitat.—Murchison District, West Australia.

This species is readily distinguished from *P. grandis*, Casteln., by its more elongate form. Five specimens have come under my notice ; three of these agree in all particulars with the description given above, and one of these is certainly a male. The other two are females, and differ from the description only in the shape of the posterior trochanters, which are almost as in *Parroa grandis* (female), being oval and narrowed to the bluntly-pointed apex, and not elongate, narrow, and bent as in the other specimens. The elongate bent posterior trochanters seem peculiar to the male ; the male of both *P. grandis* and *P. Howitti* may be expected to have similar trochanters. The posterior coxæ in all these specimens have each a single puncture near the inner margin a little before the insertion of the trochanters. The male alluded to above I have received very recently from Mr. French, of Melbourne, as coming from the Gnarlbine Goldfields, W.A. It is a fresh and perfect specimen, and has the apex of the anterior tibiæ fringed on their inner side with fulvous hair and produced forward in a strong spur about half as long as the inner apical

spur. (I find the same feature, though in a less marked degree, in the type specimen of *Adotela Frenchi*, Sl.)

Parroa lævigata, *spec. nov.*

Form light, elongate; dorsal surface lævigate. Shining black.

Male.—Head large, not narrowed behind eyes, occipital part smooth, wide, convex; a broad shallow impression on each side between the eyes extending forward to the clypeus; front convex between these impressions; clypeal suture indistinct; clypeus very lightly emarginate in front, a shallow triangular impression on each side, having a setigerous puncture placed at its inner angle; eyes round, convex, not prominent or inclosed behind. Labrum short, lightly emarginate and sexsetose in front; the anterior angles rounded; median sulcus wanting towards anterior margin, but perceptible near clypeus. Penultimate joint of maxillary palpi short, triangular, with a short erect seta on inner side; last joint a little flattened, lightly narrowed to apex, truncate; penultimate joint of labial palpi with two setæ in front and two shorter ones (one on each side) at apex; last joint broad, hardly narrowed to apex, truncate; external edge arcuate. Antennæ slender, submoniliform; second joint shorter than fourth; last short, obtuse. Prothorax subcordate, as long as broad (5 x 5 mm.), widest a little before the middle, convex, lightly declivous behind; sides subparallel between the marginal punctures, shortly rounded to anterior angles, lightly narrowed behind; base truncate; anterior margin truncate between anterior angles; these shortly but decidedly advanced; basal angles rectangular; marginal border narrow, a little widened in front to form the anterior angles, very narrow on sides near base, lightly sinuate before the base, wider, less reflexed, and entire on base; median line lightly impressed; a well-marked oblique line extending from each anterior angle about one-third across the prothorax just behind the anterior margin. Elytra oval (9 x 5·5 mm.), convex, lightly declivous behind, declivous to peduncle behind scutellum; sides subparallel in middle; shoulders rounded off; apex broadly rounded; suture strongly impressed; lateral border narrow, equal; a single puncture at the base of each elytron; three lateral punctures on each side, one behind the shoulder, the other two a little distance apart where the apical curve of the elytra begins. Prosternum deeply excavate between the coxæ, not produced backwards behind them, smooth in front of coxæ; anterior margin bordered. Ventral segments smooth, without lateral impressions, ambulatorial setæ present, two punctures on each side of anus. Legs light: femora not channelled below; anterior dilatate in middle, posterior with lower side not produced in middle: anterior tibiæ with apex wide and forming a

sharp dentiform projection externally: posterior trochanters broad, short, widely rounded at apex: tarsi narrow, without spongiose tissue on underside of anterior ones: posterior elongate; joints 1–4 successively shorter—first, long, about as long as two succeeding ones together, last narrowed to apex.

Length, 15·5; breadth, 5·5 mm.

Female differing from male in its rather lighter form; smaller head; prothorax proportionately narrower than elytra (4·25 x 4·25 mm.); elytra more convex and less widely rounded behind (8·75 x 5·25 mm.); last joint of the palpi narrower.

Length, 14·5; breadth, 5·25 mm.

Habitat.—Barrow Range, Central Australia. Two specimens, male and female.

This species is allied to *P. australis*, Sl., and *P. atronitens*, Sl., from both of which species it may readily be distinguished by the slightly projecting anterior angles of the prothorax, by both prothorax and elytra being less rounded at the middle of their length, and by the decidedly impressed suture of the elytra. These three species all have the posterior coxæ tripunctate.* *P. carbonaria*, Casteln., a black species from West Australia, very little larger than the present, I have never seen; it differs by description in having the labrum rounded.†

Parroa apicalis, *spec. nov.*

Form broad, convex; upper surface smooth, excepting apex of elytra. Black, shining. Head large (5·25 x 5·25 mm.), smooth, wide, but not swollen behind eyes; front with two well-marked long parallel impressions extending to margin of clypeus near its anterior angles; clypeal suture fine, bent forward sharply on each side, a small puncture on each side at the angles made by the lateral bend; clypeus with anterior margin very lightly concave, a foveiform setigerous puncture on each side; eyes round, convex, not prominent or inclosed behind. Mandibles long,

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* See note, *ante* p. 207.

† I have lately obtained specimens (both male and female) of *Parroa australis*, Sl., as coming from South Australia, but without exact locality. I am therefore able to report that the male is comparatively broader than the female, the elytra having a shorter and more convex appearance. The maxillary palpi have the penultimate joint very short and triangular with a seta projecting forward on the internal side, the last joint oblong, thick, truncate, a little narrowed to apex; the labial palpi have the penultimate joint bisetose in front, and without setæ at apex, the last joint thick, arcuate externally, narrowed to apex, truncate. The legs are light, the anterior femora slightly dilatate in middle, the anterior tarsi not dilatate or with brushes of spongiose tissue on underside; the posterior tarsi narrow; joints elongate, first long, hardly as long as two succeeding ones together, last elongate, narrowed to apex. Length, 15·5; breadth, 5·5 mm. Specimens before me vary in length from 14·5 mm. to 17 mm.

acute. Labrum canaliculate; anterior angles lightly rounded; margin sexsetose, lightly concave. Antennæ filiform; second joint as long as fourth. Prothorax broader than long (6·75 x 7·5 mm.), subparallel on sides, narrowed to base, subconvex, slightly declivous behind; the basal part defined by an entire obsolete impression; median line finely but distinctly impressed, crossed along its whole length by very fine striolæ; sides covered with minute transverse striolæ; anterior margin very lightly sinuate between lateral borders; base truncate, lightly bordered on each side near basal angles; anterior angles rather strongly advanced, narrowly obtuse, their inner margin almost straight; basal angles rather acute, projecting a little backwards and downwards; lateral border rather wide, with thick reflexed edge, widening in front from a little behind anterior marginal puncture, bent downward before the base, a little narrower after the sinuosity thus caused. Elytra ovate (12 x 8·5 mm.), widest rather behind the middle, convex, declivous to peduncle: posterior part declivous, and rugose towards apex; sides subparallel in middle, lightly rounded to peduncle, broadly rounded at apex; suture fine, very narrowly impressed; border narrow on sides, wider behind; two fine punctures on margin at shoulder, none along sides, a few near edge of posterior-third, becoming lost in the apical rugosity. Prosternum smooth, sloping gently to anterior margin; base emarginate; episterna very finely transversely striolate under a lens. Ventral segments smooth, excepting for a few scattered scratches; segments 3–6 lightly impressed on sides, these impressions very shallow and wide, more distinct on two apical segments. Legs light: femora excavate below only near apex; anterior rather wider, a little flattened; posterior long, not dilatate in middle: posterior trochanters short, obtuse at apex: posterior tarsi narrow; joints elongate, first long (about as long as two succeeding ones) last long, cylindric, narrowed to base.

Length, 21; breadth, 8·5 mm.

Habitat.—Australia (exact place of capture uncertain). In the collection of Rev. T. Blackburn.

This species seems an isolated one by its facies, and the form of the basal angles of the prothorax, before which the lateral border slopes sharply downwards, causing them to become acute. The elytra are much broader behind than in any other species I have seen, and far more strongly rugose towards the apex; this rugosity extends over most of the posterior declivity. The emargination of the mentum is quite edentate and even rounded behind. Only the labial palpi are present in the specimen before me; they are more slender than in any other *Parroa* I have seen; the two last joints are of about equal length, the last is

truncate at apex, greatly narrowed to base, and a little arcuate externally. The ventral segments have distinct lateral foveæ, and the apical one is without any punctures at the sides of the anus; characters I have not before seen in the genus. The emargination of the prosternum behind the coxæ is an unusual feature in the genus. The "anterior" and "inner marginal" punctures of the posterior coxæ only are present.*

Adotela esmeralda, *Casteln.*

Loc. cit., p. 175; Putzeys, Ann. Mus. Civ. Genov., IV., p. 340; Sloane, loc. cit., p. 234.

Female.—Form oval, very convex; suture of elytra not forming a depression; anterior angles of prothorax very slightly advanced; upper surface lævigate, excepting apex of elytra.

Very shining, general colour black, elytra blackish-green, the green tint becoming bright on sides and inflexed part, a green flush along upper lateral margin of prothorax, also on most of its under-parts. Head smooth, excepting clypeus, large (4 x 4·25 mm.), convex, wide, but not swollen behind eyes; front with two broad, shallow impressions diverging a little behind and extending forward across the clypeus, the space between these impressions lightly convex; clypeal suture very fine, interrupted in frontal impressions, bent forward at each side, a fine puncture on each side at the angle made by the lateral bend; clypeus a little rugulose, the lateral setigerous punctures shallow, not near edge; eyes round, convex, not prominent or inclosed behind. Labrum short, lightly emarginate; anterior angles rounded. Antennæ filiform; second joint shortest, though only a little shorter than fourth. Prothorax short (5·5 x 6·25 mm.), convex, slightly declivous behind; basal part defined by a light transverse impression not reaching to near the margins; sides rounded, very little narrowed in front, shortly but decidedly so behind; anterior margin truncate between lateral borders; base truncate, with only a slight trace of a border on each side near margin; anterior angles obtuse, very little advanced, their inner margin sloping backwards very gently; basal angles rectangular; lateral border *entire*, narrow, a little sinuate before the base; median line lightly impressed on disc. Elytra smooth, excepting a little rugosity near apex, oval (11·5 x 7·25 mm.), very convex, declivous to the peduncle, and strongly so behind; sides lightly rounded, a little more shortly so to base than to apex; suture fine, not impressed; border very narrow on sides, widening continuously, and becoming broadly reflexed from posterior-third to apex; marginal punctures wanting on middle of sides (two or three near shoulders, and four or five on posterior-third). Prosternum

* See note, *ante*, p. 207.

gently declivous in front to anterior margin, not excavate between the coxæ; base round, with a small projection behind. Ventral segments smooth. Legs light: femora—anterior thickest, flattened; intermediate narrow, longer than anterior; posterior widest in middle, a little sinuate before apex on lower side: tibiæ—anterior wide at apex, ending externally in a strong dentiform projection, external edge smooth; intermediate with outer edge concave, dilatate at apex, and ending externally in a flattened pointed projection: posterior trochanters smooth, short, regularly oval: posterior tarsi narrow, elongate; joints 1–4 successively shorter, first about as long as two succeeding ones together, last not elongate, convex, hardly narrowed to base.

Length, 19; breadth, 7·25 mm.

Habitat.—Murchison District, W.A.

The described species that can be undoubtedly referred to the genus *Adotela* are *A. concolor*, Castlen., *A. esmeralda*, Castlen., *A. carenoides*, Putz., and *A. viridis*, Macl. The difference in colour is in itself sufficient to distinguish the first from the second, while the projecting angles of the prothorax at once separates both these from *A. carenoides* and *A. viridis*. In the specimen described above, the posterior coxæ have two punctures, the "apical" and the "inner marginal."*

AMYCTERINI.

FAM. CURCULIONIDÆ.

By T. G. SLOANE, F.E.S.

The *Amycteridæ* of the Elder Exploring Expedition number sixteen species, all belonging to that division of the family characterised by having the scape of the antennæ passing the eye. I regard all as undescribed species; of this I feel the more confident because I have been able, during a hurried visit to Sydney, to compare them with the types of the Amycterides described by the late Sir William Macleay, and so to assure myself that none was among the species of that author.

It is not easy to determine the previously-described *Amycteridæ*, owing partly to the close resemblance of many of the species making their exact description difficult, and partly owing to the lamentable conciseness former authors have adopted in diagnosing their species. To their too-brief descriptions they all, unfor-

* See note, *ante*, p. 207.

tunately, seem to have added the fault of carelessness, particularly in apparently guessing at the sex of their specimens; this is shown by their sometimes giving characters that evidently belong to a female, as those of a male, and *vice versa*. No description of an Amycteride is of practical use unless the sex of the insect described is ascertained beyond any doubt, and given. The sex of all the specimens described in the following paper has been determined with certainty. This may be done very easily by relaxing the specimen and examining the pygidium, which in the male (as in the *Otiorhynchidæ)* is transversely divided, so that there is a segment more on the upper side of the abdomen in the male than in the female.

There seem many features of importance that have been overlooked by former writers on the *Amycteridæ;* some of these have been used in the descriptions that follow, while others, that seem capable of use, have been passed over as being rather of generic than specific value, the use of such features tending to overload descriptions of species and detract from their perspicuity. No doubt some of the features used in the following descriptions (as the relative length of the apical ventral segment as compared to the two preceding ones together) are of more than mere specific value, yet they are of too obvious importance to be omitted from the description of a species; at least till they have been tabulated, and their true value determined; such a work would involve an exhaustive study of the *Amycteridæ*, and is quite beyond the scope of this paper.

I would note that, to my mind, the ocular lobes of the prothorax cannot be considered as having, among the *Amycteridæ*, the classificatory value attributed to them by Mr. Pascoe in his table of genera of the long-scaped *Amycteridæ* (Jour. Linn Soc., XII., 1873, p. 21). In the genus *Acantholophus*, while many species *(A. Marshami*, Kirby, &c.) have the ocular lobes well developed, others have them almost *(A. denticollis*, Macl., &c.), or quite *(A. granulatus*, Sl.) wanting; in *Cubicorhynchus*, too, the "lobes" are sometimes present, though generally wanting. For this reason, and, because the ocular lobes seem not really processes of the prothorax, but rather to be caused by the post-ocular sinuosity of the anterior margin, I have preferred to note the shape of the anterior margin without particular reference to the "lobes."

A reference to the humeral interstice of the elytra seems needful. Sir William Macleay, disregarding the sutural interstice, calls the humeral the fourth interstice, and when explaining his divisions of the genus *Sclerorhinus* (Trans. Ent. Soc. N.S.W., I., 1865, p. 335) remarks that the fifth is more properly a lateral interstice. It is evident the sutural interstice should be counted,

and this causes the humeral one, in most Anycterides, to be strictly speaking the fifth; while the infra-humeral interstice, called by Sir William Macleay the fifth, should be considered as the sixth.

Genus Talaurinus.

There are eight species in the collection that may be referred to the genus *Talaurinus*, and, as far as I know, none is very closely allied to any previously described species.

Four *(T. regularis, T. solidus, T. Helmsi, T. æqualis)* are allied species showing a relationship to the "granulate" section of the genus; their sculpture is, however, much rougher than any "granulate" species known to me; they might be regarded as forming a separate *(roughly-granulate)* group. Though quite distinct species, all agree in general appearance, form of rostrum, and conformation of under-surface in both sexes.

The fifth species *(T. crassiceps)* seems quite *sui generis*.

The three remaining species *(T. obscurus, T. noctis, T. insignis)*, with a fourth species here described, but not belonging to the Elder Expedition collection *(T. convexus)*, are aberrant species that I cannot place in any of Sir William Macleay's sections of the genus; they are more allied to *T. rugiceps*, Macl., than to any other previously described species I have seen. *T. noctis*, *T. insignis*, and *T. convexus* have obvious affinities to the genus *Sclerorhinus* in the form of the rostrum and the conformation of the under-surface. It seems to me that the division of the *Amycteridæ* into genera founded chiefly on the form of the rostrum is too artificial to be much longer maintained. When a more natural system comes to be adopted it is probable these species will be removed from *Talaurinus*.

Talaurinus regularis, *n. sp.*

Oblong, very robust; prothorax granulate; elytra striate, the interstices regularly granulate. Black, the granules shining; spaces between the granules filled with fine cinereous scales, these thicker on elytra and forming a stripe along their margin; under-surface with cinereous-yellow scales down middle of ventral segments.

Rostrum short, narrower than head, deeply excavate, transversely impressed between external ridges at base; external ridges setigero-punctate, diverging a little in front, internal ridges obsolete — merely short processes of posterior-half of external ridges. Head broad, short, convex; front a little flattened behind rostrum; occiput with cinereous pilose scales.

Male.—Prothorax a little broader than long (5 x 5½ mm.), lightly and regularly convex transversely, lightly dilatate on sides, widest a little before the middle; disc very lightly convex

longitudinally ; anterior margin strongly sinuate, middle rounded and projecting very lightly above head ; base truncate ; granules closely placed, round, unequal, separate, unisetigerous, extending on sides to near coxæ. Elytra ovate (11 x 7½ mm.), rounded on sides, dilatate behind middle, decidedly narrowed to shoulders, very strongly and rounded declivous behind ; convex towards each side, lightly convex longitudinally ; disc depressed along suture ; base lightly emarginate ; the shoulders advanced in a strong truncate tuberculiform projection; apex wide, without sinuosity or projections near suture ; striæ uneven at bottom, having along their course very small setigerous granules between the granules of the interstices ; dorsal interstices closely set for whole length with strong, separate, unisetigerous granules becoming conical and tuberculiform on posterior declivity ; granules of first interstice small, round, evenly placed ; third and fifth interstices with the granules forming a double row in places. Metasternum convex, much raised above the plane of the first ventral segment. First ventral segment very lightly, widely, and flatly hollowed between coxæ ; second flat ; second, third, and fourth with a very light oblique impression on each side; apical segment longer than two preceding ones together, deeply excavate : the excavation parallel sided, rounded at bottom, extending for whole length of segment; a short pointed tuft of bristles placed on each side of anal excavation between last ventral segment and pygidium. Legs light ; femora cylindrical, anterior without a ridge on lower side.

Length, 18 ; breadth, 7½ mm.

Female.—Differing from male in its broader, heavier, and flatter form ; prothorax less dilatate on sides, less convex (5 x 6 mm.) ; elytra much more depressed, less roundly and strongly declivous behind (12¼ x 8¼ mm.), the apex narrower ; granules of interstices weaker, less conical, those of third and fifth placed more evidently in a double row. The under-surface differing in the yellowish scales being absent from the middle of the first two ventral segments, and more thinly-set on the middle of the last three ; first segment not hollowed in middle ; second longer and convex ; second, third, and fourth without lateral impressions ; apical segment with a small round median impression.

Length, 19½ ; breadth, 8¼ mm.

Habitat.—Westward to Everard Range, S.A. May-June, 1891.

Compared with *T. æqualis*, Sl., this species differs by the elytra strongly rounded on the sides and convex longitudinally ; their sculpture more regular, the granules of the interstices being more even and more conical.

From *T. Helmsi*, Sl., it may be distinguished by its less convex form ; and wider elytra, more dilatate on the sides, with the

granules more tuberculiform, giving the dorsal interstices a somewhat serrate appearance posteriorly.

Talaurinus solidus, *n. sp.*

Female.—Head rostrum, prothorax (5½ x 6½ mm), and under-surface not offering any decided difference from *T. regularis*, female. Elytra ovate (13 x 8½ mm.), widest behind middle, lightly rounded on sides, a little narrowed to base, strongly declivous behind, lightly convex transversely, very lightly so longitudinally; disc rather depressed, base lightly emarginate; shoulders advanced in a thick prominent tubercle; dorsal interstices closely-set for whole length with setigerous granules, these becoming tuberculiform on posterior declivity; granules of first interstice small, round, evenly placed, of second and fourth larger than those of other interstices, of third placed in a double row, except near apex, of fifth double near middle of length.

Length, 20; breadth, 8½ mm.

Habitat.—Westward to Everard Range. May, June, 1891.

Two female specimens. Closely allied to *T. regularis*, Sl. The following differences may be noted. The elytra more convex, less dilatate on sides, their sculpture more confused; the granules larger, flatter, more unevenly shaped, those of second and fourth interstices decidedly larger than those of others; fifth and sixth interstices almost straight, not deflexed posteriorly. In *T. regularis* the fifth interstice displays a decided convexity in its course, and the course of the sixth is also lightly convex.

Talaurinus Helmsi, *n. sp.*

Oblong-elliptical, subparallel; prothorax granulate; elytra striate, the interstices granulate. Black, the granules shining; the spaces between the granules sparingly filled with fine cinereous scales, these thicker on elytra and forming a stripe along their margin; head with darker scales, a few cinereous scales in middle and on each side above eyes; under-surface with a vitta of cinereous scales (not hair) down middle.

Rostrum short, excavate, without internal ridges, transversely impressed at base between external ridges, these setigero-punctate. Head broad, convex; occiput clothed with a thick velvety pile; front with short decumbent setæ. Antennæ long, slender.

Male.—Prothorax rather narrow (4½ x 5 mm.), lightly dilatate on sides, widest rather before the middle, lightly convex transversely, hardly at all so longitudinally; anterior margin strongly sinuate, middle rounded, but hardly projecting above head; base truncate; granules unequal, round, separate, unisetigerous, extending on sides to near coxæ. Elytra oval (11 x 6¾ mm.), widest rather behind middle, a little narrowed to shoulders, very

declivous behind; sides subparallel; base subcircularly emarginate; shoulders projecting forward in a short, thick, truncate tubercle; apex rounded, without sinuosity or projections near suture; striæ very uneven, having along their course very small setigerous granules; dorsal interstices regular, formed of separate large shining unisetigerous granules, these becoming more prominent and conical on posterior-half of elytra. Metasternum flat. First ventral segment lightly and widely hollowed in middle; second flat in middle; apical segment longer than two preceding ones together, deeply and subcircularly excavate, the excavation regular, without sinuosities or rugosities, sparingly clothed with short erect setæ; apex of pygidium thick, lightly emarginate; a short tuft of reddish hair on each side of the anal aperture.

Length, 16½; breadth, 11 mm.

Female.—Differing from male in having the prothorax wider and less narrowed to base; the elytra more parallel, less dilatate on sides, less roundly declivous and more flattened behind. Under-surface differing from male as in *T. regularis*, Sl.

Length, 16½; breadth, 11 mm.

Its narrower form, greater convexity, and the less conical granules of the elytra, serve to distinguish it from *T. regularis;* while its smaller size, and the less parallel and more convex form of its elytra readily separate it from *T. æqualis*, Sl. From *T. solidus*, Sl., its smaller size, narrower and more convex form, and the stronger and more regular granulation of the interstices of the elytra, together with the fewer scales of the dorsal surface, help to distinguish it.

Habitat.—Everard Range, &c., May-June.

Talaurinus æqualis, *n. sp.*

Oblong, subparallel, elytra flattened on disc; prothorax granulate; elytra striate, the interstices granulate. Black, the granules shining; spaces between the granules on prothorax without scales, on elytra sparsely filled with fine cinereous scales, these thickly-set and forming a stripe along anterior part of lateral margin; under-surface with cinerous scales down middle of ventral segments.

Rostrum short, excavate, without internal ridges, transversely impressed at base between external ridges, these setigero-punctate. Head broad, convex; front with short decumbent setæ; occiput with fuscous scales along margin of prothorax.

Male.—Prothorax a little broader than long (4 x 5½ mm.), lightly convex transversely, lightly rounded on sides, widest before the middle; disc hardly at all convex longitudinally; anterior margin strongly sinuate, middle rounded and projecting

very lightly above head ; base truncate ; granules closely placed, round, unequal, separate, unisetigerous, extending on sides to near coxæ. Elytra oval ($11\frac{1}{2}$ x $7\frac{1}{2}$ mm.), subparallel (lighted rounded) on sides, widest a little behind middle, very little narrowed to shoulders, strongly declivous behind ; disc depressed hardly convex transversely, and not at all so longitudinally ; base lightly emarginate ; the shoulders advanced in a strong subtruncate tuberculiform projection ; apex wide, without sinuosity or projections near suture ; dorsal striæ formed of numerous depressions with a small setigerous granule between each ; dorsal interstices closely-set with small setigerous tubercles becoming stronger and more conical towards apex ; tubercles of second and fourth insterstices stronger and wider apart, those of third more confused. Ventral segments with lateral impressions almost obsolete ; first segment flat, hardly the least hollowed-out between posterior coxæ ; second flat ; apical segment a little longer than two preceding ones together, deeply excavate, the excavation extending for full length of segment, parallel sided, evenly and regularly rounded at bottom ; the posterior lateral tufts of reddish hair weakly developed. Legs light ; femora cylindrical, anterior without a ridge on lower side.

Length, 18 ; breadth, $7\frac{1}{2}$ mm.

Female.—Only differing from the male by having the elytra flatter with less marked sculpture. The apical ventral segment with a large round foveiform excavation in the middle (prothorax, 5 x $5\frac{3}{4}$ mm.; elytra, 12 x 8 mm.).

Length, 19 ; breadth, 8 mm.

This species differs from *T. regularis*, Sl., by its more elongate and depressed form, and by the elytra in both sexes being far less dilatate on the sides. The granules on the interstices of the elytra are not tuberculiform, except towards the apex, and then far less strongly so than in *T. regularis*. From *T. Helmsi*, Sl., its much flatter dorsal surface, larger size, and less regularly sculptured elytra readily distinguish it. Compared with *T. solidus*, Sl., it is of lighter and more parallel form, with flatter and more regularly sculptured elytra, and with hardly any scales on the dorsal surface.

Talaurinus crassiceps, *n. sp.*

Male.—Elongate, narrow ; head (with rostrum) short and thick ; prothorax short, thickly granulate ; elytra foveo-striate, the interstices finely granulate ; legs very long and light. Black, cavities of prothorax and elytra thickly-set with cinerous scales ; sides of jaws, head, prothorax, and elytra, together with the metasternum and sides of ventral segments, sprinkled with white scales ; femora covered with white scales, becoming very thick

towards apex ; tibiæ (excepting lower side) and upper side of tarsi thickly-set with whitish scales; legs and ventral segments setigerous, the setæ black, very closely placed, but not forming a "vitta," in middle of ventral segments.

Rostrum short, thick (as thick in front as the head), scarcely emarginate and without a triangular lamina at apex, almost flat, only excavate towards apex, lightly tri-impressed at base, with a short linear median impression and a wide shallow one on each side ; external ridges short, not elevated, continuous with front ; sides of rostrum roundly convex below antennæ ; gular emargination without a median projection. Head thick, convex, whole upper-surface and external ridges of rostrum rather thickly setigerous ; occiput thickly-set with pilose scales. Prothorax transverse ($3\frac{1}{3}$ x $4\frac{3}{4}$ mm.), not dilatate on sides, widest rather before the middle, very little narrowed in front, decidedly and rather roundly narrowed behind, wider across apex than across base ; disc transversely subconvex, not longitudinally convex ; anterior margin strongly sinuate, middle rounded, but not projecting above head ; ocular lobes very prominent ; base truncate ; granules strong, thickly set, unisetigerous, obsolete on sides near coxæ. Elytra oval ($9\frac{1}{2}$ x $5\frac{1}{2}$ mm), wider than prothorax, widest about middle, evenly rounded on sides, narrowed to base, declivous behind; disc depressed, convex towards sides, hardly so longitudinally ; base very lightly emarginate; shoulders marked by a strong but not very prominent tubercle ; apex evenly rounded, without sinuosity or projections near suture ; striæ formed of close shallow foveæ ; interstices narrow, not elevated, closely-set with small setigerous granules. Apical-ventral segment not as long as two preceding ones together, not excavate. Anterior femora cylindrical, very little thickened before the middle ; lower side without a ridge.

Length, 15 ; breadth, $5\frac{1}{2}$ mm.

Habitat.—Barrow Range.

I know of no species allied to this ; its very short thick rostrum, hardly the least excavate and with weak scrobes, separates it from all the species of *Talaurinus* known to me. The late Sir William Macleay would probably have placed it in his "granulate" group.

Talaurinus obscurus, *n. sp.*

Female.—Oblong, robust ; head and rostrum large, setigero-punctate ; prothorax subcylindrical, coarsely granulate ; elytra substriate, the interstices roughly granulate, the granulations setigerous, a few fine setæ in the striæ. Black, shining ; forehead with a light vitta of griseous scales down the middle, bifurcating and the scales becoming whiter on the rostrum. Specimen

before me without other scales, excepting a ventral median vitta of short yellowish-brown scales reaching from middle of first segment to apex; this vitta narrow and very weak on first two segments, wider and continuous on last three.

Rostrum broad, thick, as wide across apex as head, lightly excavate; middle part broad, not raised into a ridge; a broad horseshoe-like impression at base, subfoveate and extending obliquely forward on each side; external ridges convex, continuous with forehead. Head broad; front depressed and lightly concave in middle behind rostrum. Prothorax a little broader than long ($5\frac{3}{4}$ x $6\frac{1}{2}$ mm.), subcylindrical, dilatate on sides, broadest before the middle, as broad across apex as across base, not convex longitudinally; disc depressed; anterior margin sinuate, truncate above head; base truncate; granules large, unequal, flattened, unisetigerous; sides lightly rugulose near coxæ; a narrow space along anterior margin rather roughly setigero-punctate. Elytra heavy, suboval (15 x $8\frac{1}{2}$ mm.), widest about middle, strongly rounded on sides, decidedly narrowed to base and apex, transversely and longitudinally convex; middle of disc depressed; base lightly emarginate; shoulders a little advanced in a strong obtuse prominence; apex with a strong triangular projection at end of second interstice of each elytron, the emarginations between these projections broad, shallow, not triangular; sculpture formed of elevations and depressions: the elevations rather regular, forming subgranulate interstices, not prominent on anterior two-thirds of elytra: the depressions irregular; posterior declivity with more regular sculpture than disc, the interstice having regular tuberculiform granules; sculpture of sides irregular, with deep transverse rugæ. Ventral segments, excepting first, impressed on sides: the impressions of third and fourth confluent, and together forming a deep fovea not extending to posterior margin of fourth; apical segment as long as two preceding ones together, not excavate towards apex.

Length, $23\frac{1}{2}$; breadth, $8\frac{1}{2}$ mm.

Habitat.—Westward to Everard Range. May-June.

This species seems more allied to *T. convexus*, Sl., than to *T. insignis*, Sl., or *T. noctis*, Sl. The differences in the rostrum, forehead, sculpture of the elytra, and the much weaker ocular lobes, &c., preclude me from thinking there can be any possibility of its being the female of *T. convexus*.

Talaurinus noctis, *n. sp.*

Female.—Oblong, robust; head broad, smooth; prothorax granulate; elytra longitudinally very convex, subfoveo-striate (the sculpture intricate), legs light. Black, shining; prothorax and elytra without scales, except some whitish ones near margin

of elytra; under-surface with a few scattered black setæ, a patch of yellowish scales on middle of anterior part of three last ventral segments.

Rostrum broad, short, not concave; the middle rather flat; external ridges diverging in front, flattened; a short deep oblique impression on each side of base, lightly connected behind, and forming a horseshoe-shaped impression. Head broad, thick, convex; front a little flattened behind rostrum. Antennæ slender; the scape very little thickened to apex. Prothorax broader than long ($5\frac{1}{2}$ x $6\frac{1}{2}$ mm.), dilatate on sides, widest before the middle, as wide across apex as across base, lightly convex transversely, not convex longitudinally; disc depressed: anterior margin strongly sinuate: middle not projecting above head; base truncate; granules large, unequal, rather flat, separate, unisetigerous (the setæ black and small); sides granulate, and rough to the coxæ; a narrow space along anterior margin free from granules, setigero-punctate, and declivous. Elytra oval (14 x $5\frac{3}{4}$ mm.), widest about middle, transversely and longitudinally convex; disc not flattened; base hardly emarginate; shoulders advanced in a strong, obtusely conical projection; apex without sinuosity or projections near suture; sculpture formed of subfoveiform depressions and irregular transverse wrinkles separated by intervals, these depressions and intervals arranged in longitudinal lines, and forming striæ and interstices; the sculpture more regular behind and on sides; striæ deep, uneven, the course of two next suture interrupted and confused, three next more even; first three interstices indeterminate and commingled, fourth hardly separated from them, fifth and sixth consisting of closely-set regular elevations; the surface of the elytra sparsely sprinkled with fine black setæ. Three last ventral segments wrinkled at the sides; apical segment not as long as two preceding ones together, a deep narrow fovea at apex.

Length, 22; breadth, $7\frac{3}{4}$ mm.

Habitat.—

This species differs conspicuously from *T. obscurus*, Sl., female, in having the elytra very convex longitudinally, and without projections or sinuosity at apex, &c., &c. It may be possible that *T. noctis* is the female of *T. insignis*, Sl., but I do not think there is any reasonable probability of such proving to be the case; however, until both sexes of this or some closely allied Amycterid are known, it is impossible to speak with certainty of the sexual differences in this group of *Talaurinus*. The differences from the male of *T. convexus*, Sl., are too decided for there to be any possibility of its being the female of that species.

Talaurinus insignis, *n. sp.*

Male.—Elongate, subparallel; prothorax very dilatate on sides, granulate; elytra foveo-striate; legs long; antennæ slender.

Black, shining; a few greyish scales in some of the foveæ of the elytra, and a discontinuous stripe of grey scales along their lateral margins. Ventral segments longitudinally impressed on each side, and having a median vitta of thick, bristly, black hair.

Rostrum short, broad, lightly excavate, without internal ridges; the middle a little raised, smooth, and longitudinally convex; a short deep fovea extending obliquely forward on each side of base, these foveæ connected behind by a transverse impression; external ridges setigero-punctate, not divided from forehead, prominent, diverging a little in front of antennæ. Head convex, setigero-punctate between the eyes; front lightly excavate, and strongly declivous to middle of rostrum.

Prothorax a little broader than long (6 x 6½ mm.), strongly dilatate on sides, widest before the middle, about as wide across apex as across base, lightly convex transversely, a little so longitudinally; disc flattened; anterior margin strongly sinuate, middle lightly advanced, but not produced over head; ocular lobes prominent; base truncate; granules large, unequal, flattened, more prominent near sides, not extending to near coxæ; the sides rugulose and setigerous near coxæ; a narrow declivous space along anterior margin free from granules and setigerous. Elytra long, narrow (14 x 7 mm.), depressed on disc, lightly declivous behind; base broadly and lightly emarginate; the shoulders projecting forward in a thick rounded tubercle; apex rounded, the edges of suture becoming very lightly dehiscent at apex, and ending in small blunt prominences; dorsal interstices subcostate, very slightly raised, forming broken discontinuous ridges, becoming rather tuberculate on posterior declivity, third most prominent and reaching almost to apex; the spaces between the interstices of dorsal surface foveate; the foveæ irregular, often confluent, and crossing the interstices; the sculpture of the sides more regular, formed of alternate transverse undulate ridges and depressions so disposed as to make regular longitudinal striæ with subgranulate interstices; the suture in a shallow longitudinal channel. Ventral segments longitudinally impressed on each side of median vitta, the impressions continuous on first and second segments, interrupted on third, extending across last two, and forming a deep oblique fovea on last; apical segment not as long as two preceding ones together. Legs long; anterior femora dilatate in middle, a longitudinal linear cicatrix on lower side of apical half;* posterior tarsi long, narrow; ungues long.

* A more or less prominent longitudinal ridge is found in the middle of the apical part of the femora in many species of *Talaurinus* and *Sclerorhinus*. Though apparently overlooked by former writers, it will probably be found of great use in grouping the species of these genera. It is essentially a characteristic of the male.

Length, 23 ; breadth, 7 mm.

Habitat.—

I cannot compare this species with any previously described species. From *T. convexus*, Sl., its more elongate form and the flattened elytra are sufficient to distinguish it at a glance. *T. obscurus*, Sl., and *T. noctis*, Sl., are founded on female specimens, and comparisons between different species of *Amycteridæ*, not of the same sex, are apt only to mislead.

Talaurinus convexus, *n. sp.*

This species from the McDonnell Ranges in Central Australia, though not one of the Amycterides of the Elder Exploring Expedition, may be very appropriately described here, as being closely allied to the preceding three species and adding another to the isolated group they form in the genus *Talaurinus*. It is represented in my collection by a single example.

Male.—Oblong-elliptical, convex ; prothorax coarsely granulate on disc ; elytra longitudinally convex, foveo-striate. Black ; a faint median vitta of griseous scales on forehead, bifurcating on rostrum ; a few griseous scales near eyes ; prothorax without scales, excepting a small patch of griseous scales in middle of vertical part of each side, and another similar patch of scales near each basal angle ; disc of elytra almost free from scales, a few in some of the foveæ, the scales more plentiful on posterior declivity, a discontinuous stripe of greyish scales along lateral margins. Ventral segments with a narrow vitta of thick, bristly, fuscous hair.

Rostrum short, excavate, without internal ridges ; the middle smooth, not raised ; a deep, broad, transverse impression at base ; external ridges not divided from forehead, lightly convex, diverging slightly in front. Head not large ; front depressed in middle, and lightly excavate behind rostrum. Prothorax broader than long ($5\frac{3}{4}$ x $6\frac{1}{2}$ mm.), dilatate on sides, broadest before the middle, wider across base than across apex, transversely convex, hardly so longitudinally, but declivous in middle to anterior and posterior margins ; anterior margin strongly sinuate, middle lightly advanced and rounded above head ; base truncate ; granules unequal, much larger on disc than on sides, separate, unisetigerous, a few smaller ones extending to near coxæ ; a narrow longitudinal median line dividing the granules on posterior-half ; a light transverse impression across anterior part, more clearly defined and nearer margin behind each post-ocular sinuation ; an obsolete longitudinal impression on each side, becoming well marked near each basal angle. Elytra oval ($14\frac{1}{2}$ x $7\frac{1}{2}$ mm.), lightly rounded on sides, widest about middle, transversely and longitudinally convex ; disc not flattened ; base

lightly emarginate; shoulders advanced in a strong obtuse tuberculiform projection; apex rounded, without sinuosity or projections near suture; sculpture regular, formed of foveate striæ and subgranulate interstices; granulations of interstices conical on posterior declivity, those of third interstice most prominent and almost reaching to apex; sculpture of sides weak after sixth *(infra-humeral)* interstice. Ventral segments longitudinally impressed on each side of median vitta as in *T. insignis*; apical segment not as long as two preceding ones together. Legs of ordinary proportions; anterior femora shorter, and less dilatate in middle than in *T. insignis*; cicatrix of apical part of lower side short and weak.

Length, $22\frac{1}{2}$; breadth, $7\frac{1}{2}$ mm.

Sclerorhinus Elderi, *n. sp.*

Oblong, convex; prothorax granulate, striate-tuberculate. Black, head and dorsal parts of prothorax and elytra thinly covered with scales of brownish-grey colour (these scales much thicker on elytra); the scales on lower parts of sides of prothorax and elytra cinereous, and placed in cavities, those of elytra forming an interrupted marginal stripe; tubercles, granules, and elevations shining; a median vitta on under-surface, this vitta in male continuous from mesosternum to apex, narrow, formed of blackish-brown velvety pile; in female discontinuous, formed (on basal segment of abdomen only) of short griseous hair-like scales.

Rostrum short, wide, hardly narrower than head, lightly emarginate in front, lightly impressed at each side of base of central ridge, which is broad, smooth, very slightly raised, not extending to forehead; external ridges hardly diverging in front, finely setigero-punctate. Head rather flattened on sides; occiput convex; front a little flattened and gently declivous to middle of rostrum.

Male.—Prothorax not much wider than long ($6 \times 6\frac{3}{4}$ mm.), dilatate on sides, broadest before the middle, shortly and roundly narrowed in front, gently narrowed behind; anterior margin sinuate, truncate between ocular lobes; base truncate; granules large, unisetigerous; sides near coxæ rugulose, not granulate Elytra oval, narrow ($14\frac{1}{2} \times 7\frac{1}{2}$ mm.), wider than prothorax, widest rather behind middle, a little narrowed to base; sides lightly rounded; base truncate; apex widely rounded, without sinuosity or projections near suture; dorsal surface not flattened, convex transversely and longitudinally; five rows of strong closely-placed tubercles on each elytron, the fourth (the humeral one) beginning at the shoulder in a strong subconical projecting tubercle; the tubercles rather flatter on dorsal surface, rounder

and conical on posterior declivity; a row of granules (stronger and closer near the base) on each side of the suture (the first and third rows of tubercles hardly extend on the posterior declivity, the second extends almost to the apex, the fourth and fifth hardly so far). Ventral segments strongly divided, impressed, slightly rugulose, and almost glabrous on each side of median vitta; apical segment not as long as two preceding ones together, the impression on each side of the median vitta deepest towards the front, not extending in full depth to either anterior or posterior margin. Legs sparsely setigerous; femora cylindrical; anterior thickened in middle, lower side with a narrow cicatrix-like ridge on apical half; anterior tibiæ sinuate and setigerous on lower side, the apex bent inwards in a single strong triangular projection.

Length, 22½; breadth, 7½.

Habitat.—Everard Range.

Female.—Larger and proportionately wider than male; prothorax (6½ x 7½ mm.) wider across base, less dilatate on sides; elytra (15½ x 9 mm.) more rounded on sides, with a small triangular sutural notch at apex; anterior femora much less thickened in the middle, the cicatrix of lower side obsolete; three last ventral segments with light rugulose impressions on each side (these impressions long, narrow, and oblique on apical segment); apical ventral segment with a narrow parallel-sided median excavation at apex.

Length, 24; breadth, 9 mm.

This species must be allied to *S. laticollis*, Macl. (the type of which from Sir William Macleay's description seems to be the male), the most apparent differences between it and that species seem—the elytra broader than the prothorax in the male, and the upper-surface not free from scales in *S. Elderi*.

Sclerorhinus occidentalis, *n. sp.*

Robust, elliptical; prothorax dilatate on sides, granulate; elytra with rows of red tuberculiform granules. Black, elytra very thickly covered with short cinereous-brown scales; a narrow median vitta of thick tawny hair extending on under-surface from mesosternum to apex.

Rostrum short, about as wide as head, considerably dilatate on sides below antennæ; external ridges parallel, convex in profile; central ridge broad, prominent, hardly divided from forehead. Head with front flattened and lightly impressed longitudinally behind the sulci of the rostrum. Head and rostrum with two vittæ of yellowish scales, sides of head with yellowish scales.

Male.—Prothorax broader than long (7 x 8 mm.), very dilatate on sides, widest before the middle, transversely and longitudinally convex; disc greatly depressed; anterior margin strongly sinuate,

the middle projecting lightly over the head; base truncate; an elongate triangular impression in front of each basal angle, a less distinct impression near each anterior angle (these impressions not meeting); median line well-marked only on disc; granules closely-set, separate, unequal, depressed, unisetigerous, obsolete on sides near coxæ. Elytra heavy, not wider than prothorax (15·5 x 8 mm.), rounded on sides, widest rather behind the middle, transversely convex; disc lightly convex longitudinally; posterior declivity rather strongly declivous; base broad, roundly emarginate; shoulder projecting in a strong obtuse prominence; apex widely rounded, without sinuosity or projection near suture, the edge very thick and prominent on each side; six rows of tubercles on each elytron: first very short, oblique, only noticeable near scutellum: second, fourth, and sixth rows not extending to base or apex: second consisting of eleven or twelve separately, but not widely-placed, small round tubercles: fourth of eight similar tubercles, not extending on to posterior declivity: sixth of much more closely placed stronger and more conical tubercles (sixteen or seventeen), extending nearer to both base and apex than those of second and fourth rows: third and fifth (humeral row) consisting of closely-placed tubercles (twenty-one to twenty-six in a row) extending from base to near apex; the tubercles more prominent behind, conical on posterior declivity; a row of fine black setæ between each row of tubercles. Ventral segments rather strongly impressed on each side of median vitta; a strong, narrow, oblique impression between first and second segments; apical segment not as long as two preceding ones together, and having the impression on each side of the median vitta deep, narrow, and parallel, Legs moderate; femora subgranulate, cylindrical; anterior dilatate in middle, arcuate on upper-side, lower-side with a long, narrow, straight, cicatrix-like ridge on anterior two-thirds; tibiæ rather strong; four posterior ones with a few short spines on inner side; anterior with two or three widely-placed dentiform tubercles on lower-side, apex bent broadly inwards, the anterior part of the projection prominent and acute.

Length, 24; breadth, 8 mm.

Female.—Differs from the male in the much less dilatate and less convex prothorax (7·25 x 8·25), the granules larger and more prominent, the lateral impression of the disc continuous from base to apex, the spaces between the tubercles filled with scales. The elytra broader (16·25 x 10 mm.), more rounded on the sides, posterior declivity a little more abrupt, the apical margin with a small triangular sutural emargination; the tubercles larger and less prominent, the second and fourth rows with fewer tubercles (only four widely placed ones in the fourth)

The median vitta of the under-surface much weaker, formed of yellowish scales and short hairs. Only the three apical ventral segments laterally impressed, the impressions almost continuous and diverging a little in front, the apical segment rugulose in middle and with a narrow transverse impression near extremity between the lateral impressions. Anterior femora without a ridge on lower side; the inturned apical projection of anterior tibiæ larger and more conspicuous.

Length, 25; breadth, 8·25 mm.

Habitat—Upper Murchison.

This species seems most closely allied to *S. molestus*, Pasc., among previously described species. My collection contains a female specimen from some part of South Australia, which is evidently *S. molestus*, Pasc.; compared with it, *S. occidentalis* is much less convex on both prothorax and elytra, has the tubercles of the elytra red (not black), and much less conical and strong on the apical half. It may also come near *S. laticollis*, Macl., but, I think, from there being nothing to the contrary in the description of *S. laticollis*, the tubercles must be placed in that species equally in all the rows, as in *S. Elderi*, Sl.; besides the present species seems too thickly covered with scales for it to be *S. laticollis*, of which Sir William Macleay says :—"The whole insect is of an almost glossy black, and free from scales."

The male is readily distinguished from the male of *S. angustipennis*, Sl., by its wide rostrum with the external ridges not convex in profile; the more convex prothorax with much larger but less prominent granules, the sides of the prothorax apparently more dilatate, with the middle projecting more sharply out from the lateral parts above the coxæ; the broader elytra more strongly rounded on the sides, the shoulders forming a large blunt projection, not a tubercle, the apex widely rounded with the edge thick and prominent on each side, the tubercles of the second and fourth rows, &c., more numerous and more closely set.

Among the Amycterides of the Elder Expedition there was only a single female of this species. I am indebted to the Rev. Thomas Blackburn for the loan of the male specimen described above, which is in his collection as coming from West Australia.

Sclerorhinus angustipennis, *n. sp.*

Male.—Elongate, convex; prothorax dilatate, finely granulate; elytra narrow, with rows of red tuberculiform granules. Piceous-black; head, prothorax, and elytra covered with ferruginous scales, these very close all over elytra (except where rubbed-off sides by femora), giving them a rusty appearance; a narrow median vitta of thick tawny hair extending on under-surface from mesosternum to apex.

Rostrum short, a little narrower than head, very little widened on sides below antennæ; external ridges almost parallel; central ridge short, narrow, prominent, not extending to forehead. Head convex, not flattened on sides; front a little flattened and very lightly declivous to middle of rostrum. Prothorax a little broader than long (7 x 7·5 mm.), very dilatate on sides, widest before middle, transversely and longitudinally convex; middle of disc rather flat; anterior margin sinuate, the middle projecting slightly over the head; base truncate; an obsolete transverse impression across the anterior part; longitudinal impressions of sides obsolete; median line very fine; granules closely-set, separate, small, round, unequal, unisetigerous, obsolete on sides near coxæ. Elytra long, narrow, not wider than prothorax (14·5 x 7·5 mm.), very lightly rounded on sides, widest abou middle, tapering to apex, transversely convex; disc very lightly longitudinally convex; posterior declivity gently declivous; base lightly and roundly emarginate; a strong blunt tubercle at shoulders; apex rounded, without sinuosity or projections near suture; six rows of tubercles on each elytron: first short, oblique, only present near scutellum: second and fourth not extending to base or to posterior declivity: second consisting of five widely-placed granuliform tubercles: fourth of three similar ones: third and fifth (humeral row) consisting of closely-placed tubercles (twenty to twenty-five in a row) extending from base to near apex and becoming wider apart and more conical on posterior declivity; tubercles of sixth stronger than those of other rows, and not extending to base or apex; a row of very fine granules bearing short decumbent setæ between each row of tubercles; ventral segments as in *S. occidentalis*, Sl. (male). Legs long; femora subgranulate, cylindrical; anterior very dilatate in middle, very arcuate on upper side, lower sides with a long, narrow, straight, cicatrix-like ridge on anterior two-thirds; tibiæ slender, four posterior ones with a few short spines on inner side: anterior with two or three widely-placed dentiform tubercles on lower side, and with apex bent inwards in a broad bifid projection.

Length, 22·5; breadth, 7·5 mm.

Habitat.—Fraser Range.

A single specimen. It is very closely allied to *S. occidentalis*, Sl. For the same reasons as given under that species I have not thought it possible for it to be *S. laticollis*, Macl.

Molochtus tibialis, *n. sp.*

Male.—Oblong-elliptical, disc of prothorax and elytra depressed; head and rostrum narrow; prothorax subquadrate, closely granulate; elytra subtriate, the interstices irregular. Black, opaque, without scales.

Rostrum short, about same width as head, deeply excavate, divided from front by a linear impression ; external ridges short, prominent, strongly punctate, very lightly divergent in front, connected behind by a curved ridge. Head small, much narrower than prothorax, convex behind ; front smooth, sparsely and finely punctulate ; anterior margin very lightly emarginate ; each side elevated into a short convex ridge in a line with, and just behind, the external ridges of rostrum (these ridges raised above the plane of the external ridges). Prothorax subquadrate (5·5 x 5·75 mm.), widest about middle, truncate in front and behind, flat on disc, very declivous behind, very lightly declivous from middle of anterior part of disc to anterior transverse impression ; sides very lightly rounded in middle, gently but decidedly narrowed in front, shortly narrowed behind ; a narrow linear transverse impression a little behind anterior margin ; two small prominent conical tubercles on each side, one placed where the sides begin to narrow in front, the other (larger and more prominent) in a corresponding position behind : another tubercle, about equal in size to the latter, placed on each side above the basal declivity—the space between these wide and concave ; granules strong, small, well-defined, very closely set, rather diamond-shaped, punctured at apex, but not setigerous. Elytra a little wider than prothorax (12 x 7 mm.), subparallel, very lightly rounded on sides, widest about middle ; disc flattened, posterior declivity abrupt ; base truncate ; apex with a very short triangular projection on each side of suture, the emargination between these light triangular ; a strong conical tubercle at each shoulder, and another similar, but much smaller, on base at half the width of each elytron ; sculpture rather regular ; the striæ sub-foveate, seven granulate striæ on each elytron, those on disc with the granulations, especially towards the suture, confluent and divided by wavy transverse depressions ; others stronger, more regularly granulate ; the granules becoming more prominent and conical behind ; numerous shallow punctures without setæ dispersed over elytra. Metasternum flat, thickly covered with minute granules. Ventral segments strongly divided, not setigerous ; first and anterior-half of second minutely granulate ; last three and posterior part of second coarsely punctate ; apical segment as long as two preceding ones together, lightly impressed towards apex ; second segment lightly and widely hollowed between the coxæ. Legs long ; anterior tibiæ with external edge strongly arcuate near apex, inner side with a deep short emargination before apex, apex produced inwards in a broad strong projection.

Length, 18·5 ; breadth, 7 mm.

Habitat.—Fraser Range.

Female, compared with male, larger, broader, and flatter. Pro-

thorax (6 x 6·5 mm.) flatter, more strongly granulate; three strong lateral tubercles on each side, two of these as in male, the third smaller and placed a little in front of the one where the sides begin to narrow in front. (There are faint indications of this tubercle in the male.) Elytra more robust, greatly wider than prothorax (16 x 9·5 mm.), more evenly and strongly sculptured; the triangular notch at apex much deeper, the projections on each side of it more prominent; second ventral segment not hollowed between coxæ; apical segment with edge a little upturned round apex. Legs shorter; anterior tibiæ less arcuate on external edge, and without the broad inward projection and ante-apical notch of lower side.

Length, 25; breadth, 9·5 mm.

When in Sydney I was able, through the kindness of Mr. Masters, to compare *M. tibialis* with a specimen (evidently a female) of *M. gagates*, Pasc., received by him from Mr. Pascoe. I would note the following differences:—*M. tibialis* has the rostrum more deeply excavate, with longer and more prominent external ridges, the front with a strong prominence on each side behind the external ridges of the rostrum (in *M. gagates* these prominences are obsolete); the prothorax flatter, with the large tubercles more strongly developed, excepting the two on the base, which in *M. gagates* equal those near the basal angles; the granules more prominent, more numerous, and more clearly defined; the elytra flatter, and somewhat differently sculptured, the granules being in rows, separated by wavy interrupted striæ. (In *M. gagates* the sculpture is rougher and more confused, with the transverse impressions deeper.

This species seems to have an extensive range, the male is labelled "Fraser Range, October," the female "May-June" (westward to Everard Range).

Acanthologus granulatus, *n. sp.*

Of elongate elliptical form; elytra much wider than prothorax; dorsal surface of prothorax flat, tuberculate, with lateral margins dentate; elytra striate, the interstices closely granulate. Black, with cinereous scales; the scales whiter, and sparsely placed on sides of rostrum, prothorax, and elytra, very thinly scattered among the cavities on disc of prothorax, thicker on middle of posterior part, set in thick patches on the dorsal surface and apical declivity of elytra, giving the elytra a mottled ashen appearance.

Rostrum short, about as wide as head, very deeply excavate; external ridges rugulose, setigerous, very much elevated, as high behind as in front, cut obliquely to apex of scrobe in front, separated from frontal crest by an oblique gap; a transverse im-

pression at base, bifurcating at sides, the anterior branch forming the gap between the external ridges and frontal crests, the posterior branch extending on to these latter. Head flat and rugulose in front; frontal crests narrow, very elevated, obliquely truncate at summit. Prothorax almost as long as broad (4 x 4·25 mm.), truncate in front and behind; dorsal surface flat, strongly and very closely tuberculate; median line lightly marked; a strongly marked narrow transverse impression near anterior margin, and another near base; lateral margins produced and quadridentate between these impressions (third projecting tubercle of side very small); vertical part of sides convex, lightly rugulose; a dentiform tubercle on each side of the disc in front of anterior transverse line, and a strong conical tubercle on each side of median line near base. Elytra oval (10 x 6·25 mm.), evenly rounded on sides, perpendicularly declivous behind; base truncate between shoulders, gently but greatly declivous to peduncle; apex widely rounded; the elytra lightly dehiscent at suture, and each ending in a short triangular projection; disc depressed, but slightly convex transversely and longitudinally; striæ continuous, a little uneven; first seven interstices with a row of small very closely-set regular setigerous granules (these rows having a tendency to become double on parts of first three interstices); the granules of fifth and sixth interstices near the base, and of all the insterstices on posterior part, becoming tuberculiform; a rather strong tubercle at each shoulder at beginning of fifth interstice. Tarsi broad, short.

Length, 16·5; breadth, 6·25 mm.

Habitat.—Barrow Range, Central Australia (August, 1891).

There is only a single example of this well-marked species; unfortunately the abdomen is broken, so that I have been unable to ascertain the sex, though I believe it to be the male. I know of no species that is closely allied to this; in the shape of both rostrum and forehead, it shows a relationship to the genus *Molochtus*, which its author, Mr. Pascoe, thought more allied to *Talaurinus*. In this I do not agree, for it seems to me the affinities of *Molochtus* are more to *Acantholophus* and *Cubicorhynchus*.

Cubicorhynchus occultus, *n. sp.*

Oblong, convex; prothorax granulate; elytra striate, the interstices granulate; anterior coxæ not contiguous. Black with cinereous scales.

Rostrum short. Head convex behind; front flat, a few faintly marked rugosities towards vertex; frontal crests not prominent, continuous with, but a little more raised than, external ridges of rostrum, truncate behind, conical at apex.

Male.—Prothorax a little broader than long (4 x 4½ mm.),

truncate in front and behind ; strongly and almost vertically declivous to peduncle ; sides roundly dilatate, more shortly rounded in front than behind ; disc rather depressed, slightly convex transversely and longitudinally ; a strongly-impressed line a little behind anterior margin (causing the anterior margin to be completely girdled by a convex *collar*) ; median line very lightly marked ; small separate unisetigerous granules rather thickly placed all over disc, and on sides about half-way to coxæ ; space between granulate portion and coxæ smooth. Elytra a little wider than prothorax (8·5 x 5·5 mm.), oval, widest about middle ; base rounded with long oblique declivity to peduncle ; posterior declivity abrupt ; disc rather depressed, lightly convex transversely and longitudinally ; seven granulate interstices on each elytron : granules of first interstice weak, of first and second not extending to the posterior declivity, of other interstices becoming stronger towards apex, those of fifth tuberculiform (about three) at commencement of posterior declivity : granules closely and regularly placed, separate not setigerous ; brownish cinereous scales rather thinly dispersed all over the elytra. Under-surface thinly sprinkled with pale setæ and scales ; first ventral segment concave ; second lightly and broadly impressed in middle ; apical segment with a very light median impression towards apex. Legs long, light, covered (most thickly towards apex of femora and on tibiæ) with gray scales and setæ ; anterior femora cylindrical, narrow and bent near base, thickened on apical-half ; anterior tibiæ strongly arched, inner edge serrate, the serrations separate and granulate ; joints of tarsi squamulose on middle of lower side.

Length, 14 ; breadth, 5·5 mm.

Female.—Compared with male. General form broader and heavier. Head wider. Prothorax proportionately wider (3·75 x 4·5 mm.) ; disc more depresssd ; sides less dilatate, a conspicuous small conical granule on each side on anterior of *collar ;* the posterior declivity shorter and almost vertical to the peduncle. Elytra much wider (9 x 6·25 mm.), more regularly convex ; posterior declivity more gently rounded, and less abrupt ; the granules of the interstices more regular, and, though becoming stronger backwards, yet none of them tuberculiform, those of third and fifth interstices equally strong behind. Ventral segments not impressed. Anterior femora not bent near base.

Length, 14·5 ; breadth, 6·25 mm.

Habitat.—Fraser Range (October 1891).

Cubicorhynchus modestus, *n. sp.*

Female.—Oblong, convex ; prothorax strongly granulate ; elytra striate, the interstices with setigerous granules anterior

coxæ not contiguous. Black, sparsely sprinkled with brownish scales, the setæ of dorsal surface fulvous.

Rostrum short, flat. Head convex behind; front slightly rugulose, without tubercles; frontal crests prominent, conical. Prothorax broader than long (3 x 3·5 mm.), hardly declivous to peduncle; disc depressed, lightly convex transversely, and very lightly so longitudinally; a transverse impression near anterior margin obsolete on sides; anterior margin with very lightly marked post-ocular sinuations; base truncate, lightly bordered; granules strong, tuberculiform, separate, unisetigerous, more thickly placed on sides of disc than on middle; vertical part of sides granulate rather more than half-way to coxæ, space between granules and coxa smooth. Elytra much wider than prothorax, oval (7·5 x 4·75 mm.), widest about middle, shortly rounded at shoulders; base truncate, declivous to peduncle; posterior declivity abrupt; disc depressed, lightly convex transversely, hardly so longitudinally; seven granulate interstices on each elytron; granules closely and regularly placed, setigerous, those of first and second interstices weak, of third, fourth, and fifth stronger, conical, becoming more prominent towards apex; seventh interstice with only a few granules near shoulder. Under-surface shining, sparingly sprinkled with pale separate hairs. Legs as usual in genus; tibiæ ciliate, with rather long fulvous hairs; tarsi without squamulæ on middle of lower side.

Length, 11; breadth, 4·75 mm.

Habitat.—Barrow Range.

The following species, which I regard as *Cubicorhynchus cichlodes*, Pascoe, I consider it to form the type of a new genus, and as Mr. Pascoe's description is very brief, I now offer a more detailed one. As explaining the apparently greater size of the present example as compared with Mr. Pascoe's figures, it may be remarked that his measurement (length only) is exclusive of the rostrum; excluding the rostrum the example before me is five lines long, or only half a line more than Mr. Pascoe gives.

Notonophes, *n. gen.*

Allied to *Talaurinus*. Form oval, robust. *Rostrum* broad, flat, not divided from head; a light, linear, longitudinal impression in middle; external ridges prolonged backwards to eyes, becoming more prominent behind; scrobes widening backwards and reaching the eyes. *Eyes* transversely oval. A large deep fovea on lower side of throat. *Antennæ* robust; scape about half the length, light, slender at base, gradually thicker to apex; joints of funicle short, thick, cylindrical, setose: two first about equal, a little longer than others: third shorter: fourth, fifth, and sixth still shorter, equal; club about as long as three preceding

joints together, thick, hardly incrassate. *Prothorax* short, sparingly-set with round, prominent, shining, unisetigerous granules; base closely applied to elytra; anterior margin lightly sinuate. *Elytra* broad, substriate. Three last ventral segments strongly divided; apical segment not longer than two preceding ones together. *Legs* light, short; anterior coxæ contiguous; tarsi short.

Except for the head the species on which this genus is founded has entirely the form of a *Talaurinus*. I see no reason for regarding the single specimen before me as different from *Cubicorhynchus cichlodes*, Pascoe, though the head seems less convex in profile than is shown in the drawing of the head of Mr. Pascoe's species. It has no close affinity to any Amycterid known to me. Mr. Pascoe says *C. cichlodes* res mbles *Talaurinus cricetus*, but he does not attribute that species to any author, nor have I ever seen any reference to such a species exeept this of Mr. Pascoe.

Notonophes cichlodes, *Pasc.*

Cubicorhynchus cichlodes, Pasc., Journ. Linn. Soc., XII., 1873, p. 18.

Oval, robust, convex; prothorax transverse, granulate; elytra convex, substriate, the interstices granulate. Black; a large patch of yellowish scales on each side of rostrum below the scrobes; upper-surface of head, excepting a narrow space in middle and the anterior part of the rostrum, thickly covered with yellowish scales; prothorax thickly covered with brownish-yellow scales, three whitish vittæ on upper-surface (one down middle and one on each side); elytra thickly covered with brownish-yellow scales; an obsolete whitish vitta along suture, another very conspicuous whitish vitta on each side between fourth and fifth rows of granules, a broad white stripe along each lateral margin; under-surface shining, a broad patch of very short yellowish scales on middle of each ventral segment; legs (particularly the tibiæ) covered with white scales.

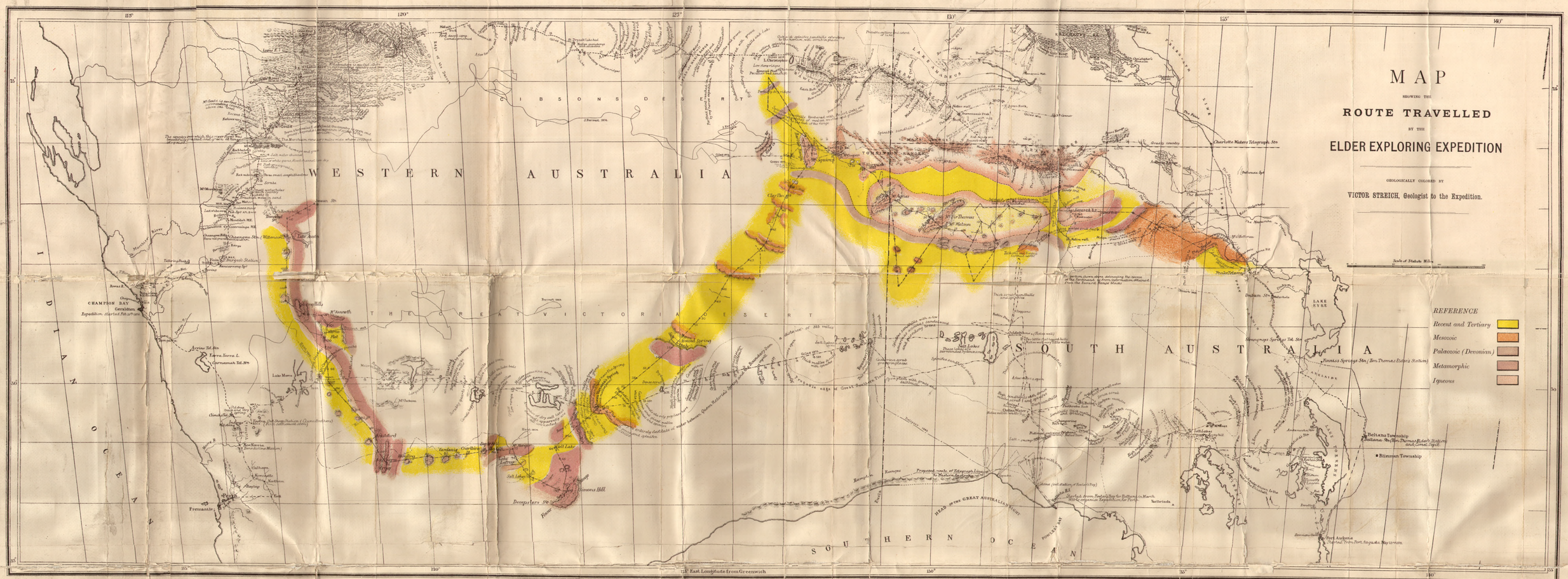
Rostrum very broad, short, not divided from head on upper-surface, almost vertical on sides; anterior lamina triangular, the apex rounded, a deep channel just behind it and following its course; external ridges diverging a little backwards, not elevated along sides of rostrum, continuous with the frontal crests. Head and rostrum flat; front with a long triangular horn or crest on each side projecting outwards obliquely over the eye in line with the external ridges of rostrum, a light sinuosity where the horn and external ridge meet. Prothorax much broader than long (2·75 x 4 mm.), widest about middle, strongly rounded on sides, strongly convex transversely, not convex longitudinally; anterior margin very lightly sinuate, the middle not projecting over the

head ; base truncate ; granules of disc widely separated, round prominent, shining, unisetigerous, those near front small, none along course of the vittæ, those of sides closer and more conical. Elytra short (7·5 x 5·5 mm.), much wider than prothorax, strongly rounded on sides, widest rather behind the middle, transversely convex ; disc longitudinally convex, not flattened ; posterior declivity round, abrupt ; base broad, much wider than prothorax, roundly emarginate ; the shoulders not projecting forward ; apex rounded, without sinuosity or projection near suture ; striæ irregular, subfoveate ; interstices closely and rather evenly granulate, the granules small, round, shining, a little confused on disc, each bearing a long decumbent seta.

Length, 12 ; breadth, 5·5 mm.

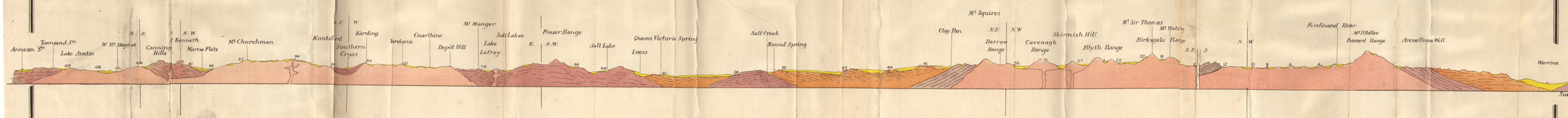
Habitat.—Murchison River District, W.A.

I have not ascertained the sex of the specimen described, but I think it is the female. A single specimen of another species is in my collection ; in it the external ridges of the rostrum do not run back into horns on the front, the elytra are foveostriate and without granules ; it seems to be a male ; if so the exual characters are not very different in the sexes in this genus.



SKETCH SECTION FROM WARRINA TO ANNEAN STATION.

Compiled by VICTOR STREICH, Geologist to the Expedition.



Horizontal Scale, 48 miles to 1 inch. Vertical Scale, 200 feet to $\frac{1}{10}$ inch.

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